

IDENTIFICATION AND CATEGORIZATION OF ACCIDENTS AND INJURIES IN CABS OF LOCOMOTIVES

SEPTEMBER 1972

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16. Abstract <p>A review and categorization is made of available published locomotive cab accident reports and statistics, as well as of unpublished accident reports from a number of individual railroads. Major hazards related to locomotive control compartment accidents are identified and categorized in summation form.</p> <p>Conclusions stress the need for designing greater elemental safety in strength and location of the control compartment, as well as providing a more livable environment for occupants in the control compartment of locomotives. A recommendation is directed to the Federal Railroad Administration, Locomotive Cab Committee, that they proceed with their plans for a series of locomotive impact tests in a continuing effort to improve safety in the control compartment of locomotives.</p> <p>The contents of this report reflect the views of Central Technology, Inc., which is responsible for the facts and the accuracy of the data presented herein. The contents do not necessarily reflect the official views or policy of the Department of Transportation. This report does not constitute a standard, specification or regulation.</p>			
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ABSTRACT

A review and categorization is made of available published locomotive cab accident reports and statistics, as well as of unpublished accident reports from a number of individual railroads. Major hazards related to locomotive control compartment accidents are identified and categorized in summation form.

Conclusions stress the need for designing greater elemental safety in strength and location of the control compartment, as well as providing a more livable environment for occupants in the control compartment of locomotives. A recommendation is directed to the Federal Railroad Administration, Locomotive Cab Committee, that they proceed with their plans for a series of locomotive impact tests in a continuing effort to improve safety in the control compartment of locomotives.

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ACKNOWLEDGMENTS

The findings contained in this report are fundamentally the responsibility of Central Technology, Inc. (CENTEC). However, they are the result of efforts expended by a number of people, including the initial guidance provided by staff members of the Office of Safety, Federal Railroad Administration, and other offices of the FRA.

Gratitude is due to all. However, the author of this report desires to specifically cite the FRA Locomotive Cab Committee for their full cooperation and assistance in this investigation. This committee is composed of FRA staff and representatives of the Association of American Railroads, the Brotherhood of Locomotive Engineers and the United Transportation Union.

The author also wishes to thank the executive officers of the following four railroads whose gracious reception and aid in this study were invaluable:

Southern Pacific Transportation Company
Burlington Northern, Inc.
Louisville and Nashville Railroad Company
Southern Railway Company

Gratitude is also due to the representatives of locomotive builders.

Frank Kurz, Special Consultant
Central Technology, Inc.
Silver Spring, Maryland

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EXHIBITS

INTRODUCTION

On June 9, 1971, an informal conference was held in the offices of the Bureau of Railroad Safety, Federal Railroad Administration, with representatives of certain railroads, railway labor organizations and associations, locomotive builders and government agencies to discuss various safety aspects of locomotive control compartments. As a result of this meeting, the Bureau of Railroad Safety established the Locomotive Cab Committee for the purpose of continuing the joint efforts of the conference toward improving locomotive safety.

Central Technology, Inc., under the direction and guidance of the Committee, was assigned the task of performing a comprehensive review and analysis of available locomotive cab accident statistics, and preparing a summary report identifying and categorizing the major hazards in locomotive accidents. Specifically, the terms of reference for this assignment were as follows:

"Collect and review available data on cab accidents including the following:

Annual Reports of the Section of Locomotive Inspection,
1961 through 1965.

Accident Report Bulletins, 1961 to present.

National Transportation Safety Board Reports, 1967 to present.

Annual Statistical Summaries, 1961 to present.

Locomotive Inspection Reports, 1961 to present (if applicable).

Identify and extract data relative to locomotive cab accidents and categorize data by accident causes. Prepare a summary report identifying the major hazards in locomotive cabs."

Data contained in this summary report were actually collected and reviewed from the following sources:

1. The published reports from 1961 to present of investigations of railroad accidents by the Bureau of Railroad Safety and the National Transportation Safety Board.

Approximately 300 Accident Investigation Reports were reviewed.

2. Additional data relating to these accidents in the file jackets of the Accident Investigation Branch (Mr. W. McCarthy) of the Office of Railroad Safety.

Numerous jackets were pulled and reviewed. It might be noted that the material in these jackets will be useful in further analysis of accidents reported in this study by the Committee when considering the various elements of cab redesign.

3. The Annual Reports of the Section of Locomotive Inspection (1961 through 1965).

4. T-forms of similar accidents from 1965 to the present.

Here a comment on the T-forms is deemed appropriate and pertinent. To use these forms for the purpose suggested here was practically an impossible task. To use a print out of these forms relating to these cab accidents would only supply the numerical statistics (as shown on Exhibit G) and these are not classified in the same detail or definition to compare with information drawn from the Annual Reports. For example, there is no additional detail that might be pertinent to the injury. However, and probably more serious, is the ever present possibility of erroneous coding of the occurrences by persons not always familiar with happenings on the railroad.

5. The Annual Statistical Summaries from 1961 through 1970 were used in preparing Exhibit A.

6. Documented sources from the following railroads for supplementary information on cab accidents:

Southern Pacific Transportation Company
Burlington Northern Railroad
Louisville and Nashville Railroad Company
Southern Railway Company

The railroad documents included telegraphic reports of accidents, T-forms and files on specific hazards in locomotive cabs. These documents include historical summaries and investigations of the causes of accidents.

Eight days were spent on these railroads, during which time some thousands of such reports were perused for data that could be useful in this report.

SUMMARY OF FINDINGS

This report covers a tabulation of 858 accident cases in cabs of locomotives from 1961 to present, involving a total of 229 fatalities and 1260 injuries.

The study divides itself naturally into two parts, the first of which deals with train accidents comprising collisions, derailments and highway crossing accidents of major type with heavy truck-trailers and other heavy equipment. The second concerns itself with the environment in the cab of locomotives involved with injuries.

Exhibits A through F cover the first portion. Exhibit A tabulates certain statistics of train accidents taken from the FRA Accident Bulletins, Nos. 130 - 139, from 1961 through 1970. Exhibit B tabulates 71 head-end collisions; Exhibit C, 85 rear-end collisions; Exhibit D, 27 derailment/side collision combinations; Exhibit E, 39 derailments; and Exhibit F, 60 train-truck collisions.

Exhibits G through U cover the second or environmental part of this study, and include injury cases from the following categories:

- Exhibit H - Hard couplings, rough track and slack action
- Exhibit I - Cab doors and latches
- Exhibit J - Cab seats, arms and back rests
- Exhibit K - Cab windows
- Exhibit L - Striking appurtenances in the cab
- Exhibit M - Falling objects
- Exhibit N - Water coolers
- Exhibit O - Trips on obstructions in the cab or nose
- Exhibit P - Trap doors and openings in the cab floor
- Exhibit Q - Cab heaters
- Exhibit R - Slips and falls on cab floors and steps
and nose compartment
- Exhibit S - Injuries within the cab resulting from
brake and brake equipment defects
- Exhibit T - Fumes, smoke and gases in the cab
- Exhibit U - Eye injuries

In view of the Locomotive Control Compartment Committee's commitment to a study of the safety of locomotive cabs, this information may well form the basis for the Committee's study of the improvements in cab design. Accordingly, the following conclusions are deemed in order.

CONCLUSIONS

The severity and nature of the accidents in the first part of this report point to the need of designing greater elemental safety in strength and location of the control compartment in locomotive cabs. The second portion of this report emphasizes the necessity of providing

more "livable" environmental conditions for the cab interior and elimination of obvious safety hazards. All the situations reviewed need a more careful consideration and more research into the possible location of the interior appurtenances. The "rough island" of the control stand is just one example where further research is indicated to improve the cab interior condition.

The causes of the major accidents have not been included to establish culpability or excuse. It is not known to what extent the "lesser" cab environmental hazards may have influenced the locomotive operator's senses of perception, alertness, and response to the conditions that ultimately involved him and the train in the accidents noted. These causes need to be studied, not as mere occurrences, but so as to determine to what extent the physiological and psychological processes of the locomotive cab occupants have been influenced by the actual cab environment. An in-depth research with a locomotive control compartment simulator can accomplish much and is necessary for consideration of cab redesign that will provide the safety sought.

What is needed in an over-all study of locomotive design to obtain the proper layout of the control compartment is not a "patch up" job of rebuild, but a carefully researched redesign.

The wide range of safety problems evidenced by the data collected strongly indicates that a complete design approach to the entire cab environment is necessary. Conclusions based upon this study are listed below:

1. Design against vulnerability of control compartment.
2. Design cab interior so as to eliminate projection of appurtenances.
3. Design cab interior against danger from possible falling objects.
4. Relocate water cooler.
5. Design slip resistant floor for cab and nose compartment.

On July 13, 1972, members of the Locomotive Control Compartment Committee met in Montreal, Canada at the invitation of the Canadian National Railways to view their mock-up of a new design of a locomotive cab. Some of the improvements featured were the closed forced air circulating system, greatly increased wall thickness of the front, side and top of the nose compartment, and the improved floorplan of the control and nose compartments. In view of the work done by the Canadian National Railways, the Locomotive Control Compartment Committee is preparing plans to proceed with a series of locomotive impact tests in a continuing effort to improve locomotive safety. It is recommended that these plans be progressed to actual accomplishment of these tests with all necessary stress and displacement measurements to be recorded. The results of these tests will be necessary for the consideration of any redesign of locomotive control compartments.

COMMENTS ON EXHIBITS

EXHIBIT A

The train accident statistics tabulated in Exhibit A present a background for the study involving head-on, rear-end and side collisions, derailments and train-truck accidents. Over the 10 year period there were a total of 381 rear-end, 251 head-on and 92 side collisions. The documents reviewed in detail in this study cover 85 rear-end, 71 head-on and 27 side collisions or about 25% of the total cases. There were a total of 38 derailments reviewed, also.

However, the catastrophic severity of the cases under study is reflected in the fact that they account for 155 of the total 232 fatalities tabulated or about 67%, which would indicate that the base used for this study is broad enough to certify its validity.

Not under consideration, but certainly of more than passing interest, is the increasing trend over the ten year period in the number of train accidents, casualties and the costs of damage of these accidents. The ratio of train accidents to million locomotive and motor train miles also reflects this, having increased from 4.46 in 1961 to 9.65 in 1970. In view of this, the importance of the consideration of the data in this study for the necessary improvements in locomotive cab design and environment takes on added significance.

EXHIBITS B, C, D, E AND F

These exhibits cover the 282 cases reviewed of head-on collisions, rear-end collisions, derailment/side collisions, derailments and train-truck collisions at highway crossings occurring between January 1961 and June 1972. The documents used included the published reports of investigations of these accidents by the appropriate governmental agencies, some of the file jackets of the FRA investigations, and in some cases, the railroad files themselves. The occurrences are identified as to date, location and the railroad involved. Where known, the impact or closing speed is shown and the type of unit involved. The casualties as to type and location are tabulated. A brief statement regarding damage to the units and cause of the accident completes the data. While the statement of damage is not given in explicit detail, data is sufficient to indicate the vulnerability of the position of the cab occupants in these accidents.

EXHIBIT B - HEAD-END COLLISIONS

This type of accident can be designated generally as having the greatest potential for aggregate destructive forces, with the two heavy and virtually solid motive power combinations moving towards

each other, meeting at substantially high closing speeds. The mass of the trains behind the locomotives tends to compound the kinetic energy through the draft gear compressions at impact.

Seventy-one head-end collisions are tabulated, which resulted in 52 fatalities in locomotive cabs, 7 in caboose (or in train, as passenger train) and 4 from alighting off the units.

The severity of destruction of the impacting units is reflected in the fatalities. The closing speed (of speeds that range from 7 to 85 mph) at impact, averages out at 35 mph, and 75% of the fatalities in the control compartments in head-on collisions occurred at speeds above this average. In each of these cases, the leading units were generally destroyed or heavily damaged, with the cab most often crushed, demolished or wiped out. In other cases, such potentially movable appurtenances as seats, control stands, etc., were generally found torn loose and lying on the floor, all potential agents of injury and fatality to the cab occupants. In some cases, there have been instances of over-riding of one unit by another or by cars in the train. Where pictures of these collisions were available for review, it was noted that the collision forces generally tended to direct the units laterally. In some instances, where curves were involved, the diversion was noted to have been directed toward the inside of the curve.

EXHIBIT C- REAR-END COLLISIONS

In rear-end collisions the total destructive forces from the kinetic energy of the trains involved may not attain the magnitude of head-on collisions because in most instances one of the trains involved is standing, the nature or direction of these forces is still devastating, not only to the caboose or cars struck, but also to the impacting locomotive. Here the road-switcher type of unit with the short, low hood presents a particularly vulnerable control compartment, which in many of the cases reviewed had been crushed, demolished or wiped out by the over-riding underframe of the caboose or car struck.

Eighty-five occurrences of rear-end collisions were reviewed in which 84 fatalities occurred. Of the instances where fatalities in the cab occurred, 50% are specifically noted to have had an over-ride of the control compartment by the caboose or car. Of the 36 accidents where fatalities in the cab occurred, 29 involved the destruction, crushing and demolishing of the cab, and in the other cases heavy damage to the units was noted.

This vulnerability of the control compartment points to the need for new design considerations to mitigate this danger to cab occupants in rear-end collisions, especially from the destructive over-riding by the other equipment. Compounding this safety problem is the significant rising trend of rear-end collisions as indicated in Exhibit A.

EXHIBIT D - DERAILMENTS/SIDE COLLISIONS

Here are tabulated 27 instances of accidents where the collision forces are of a glancing direction, generally occurring when a passing train strikes a derailed piece of equipment on adjacent track or cutting into a train on the main line while exiting from a siding (or vice-versa). While the ratio of fatalities to incidents here is less proportionate, nevertheless, these occurrences need to be analyzed and considered in any redesign of the locomotive control compartment.

EXHIBIT E - DERAILMENTS

This tabulation of 39 derailments includes those derailments resulting from trains running at excessive or, in some cases, uncontrolled speeds into restricted curves or turn outs and such cases as trains running into slides, washouts and similar track disturbances.

Obviously, it is not possible to design a cab structure to withstand all manner of destructive force, but, again, an analysis of these accidents also requires consideration in the cab design study.

EXHIBIT F - TRAIN-TRUCK COLLISIONS AT HIGHWAY CROSSINGS

With the ever increasing number and size of highway motor transport truck-trailers combinations, the fatality rate per accident is of special concern. This is particularly true when truck-trailer combinations loaded with flammable contents are involved in collisions. Of the 60 cases reviewed, with a total of 50 fatalities, 18 involved truck-trailers loaded with flammables resulting in 42 fatalities. All the "on ground" fatalities were of cab occupants who had been subjected to the flames and had jumped prior to their death. Only in 4 cases were there any crew members surviving as injured casualties.

To afford more protection to the crew members against collision with a truck loaded with flammables, there appears to be a most urgent need for changes in design of the locomotive control compartment. Much study will be required to improve this situation.

EXHIBIT G - SELECTED FROM TRAIN SERVICE ACCIDENTS TAKEN FROM THE STATISTICAL SUMMARIES OF THE FRA ACCIDENT BULLETINS, NOS. 130 - 139

This exhibit tabulates the casualty statistics from selected causes as indicated by the code numbers, which are defined in the FRA "Rules Governing the Monthly Reports of Railroad Accidents". The causes selected were taken so as to attempt to portray certain environmental conditions in locomotives resulting in casualties. Here it was virtually impossible to match specific hazardous conditions as

gathered from the annual reports or from railroad accident files. Only code Nos. 5106, 5109 and 5117 were sufficiently definitive to be identifiable with data gathered from the various other sources used. The specific cab environment conditions that involved injury and that could be identified from sources other than these Accident Bulletins are detailed in Exhibits "H" through "U", together with some detail as to the nature of cause of the injury. The latter type of information is not available from either the Accident Bulletins or the tapes of key punched T-forms.

EXHIBIT H - TRAIN ACCIDENTS - HARD COUPLINGS, ROUGH TRACK AND SLACK ACTION

These accident cases were gathered chiefly from the accident files of the railroads visited, and generally involved more or less minor injuries to the cab occupants as a result of their having come into severe contact with some part or appurtenance of the cab. Identification by date of occurrence and the railroad involved is given, as well as a brief description of the accident, and, where known, the coupling or contact speed is included. In many of the cases, these injuries shown do not classify as reportable injuries as required by FRA regulations.

It is obvious that the cases tabulated are only a fragmentary representation of the total that occur on all the railroads. Only 65 cases resulting in 67 injuries are listed, and practically all have occurred in yard service. The consideration of these accidents is deemed desirable, in view of the increase in the number of yard accidents, as shown in Exhibit A, from 682 in 1961 to 1426 in 1970. Since the injuries shown in Exhibit H have occurred in the cab, they appropriately need to be considered in the study of a redesign of the cab environment.

CAB ENVIRONMENT INVOLVING INJURY EXHIBITS I THROUGH U

These thirteen exhibits list a total of 511 accidents resulting in 520 injuries sustained from coming in contact with various items of cab furniture, fixtures and appurtenances comprising cab environment, including eye injuries, as well as the contamination of the cab air by fumes and gases. Information obtained from the four railroads visited was very useful in augmenting the data from the FRA records. It should be noted that the depth of information secured from the railroads includes many cases that do not classify as reportable injuries as required by FRA regulations.

It must also be noted that the cases listed herein are by no means the total number of such incidents. Lack of time precluded visiting more railroads and obtaining greater depth in data collection. However, there is sufficient data to indicate which conditions existing in cabs need to be considered in the redesign of the cab to improve cab environment.

EXHIBIT I - INJURIES FROM CAB DOORS AND LATCHES

Here are tabulated 148 cases, involving 148 instances where the cab occupants sustained injury, mostly to fingers from their being closed in cab doors. In some cases, defective equipment was found to be responsible, while employee carelessness heads the list of causes. But whether it be defective equipment or careless placement of hands and fingers in the doorways that results in the accident, and in view of the large number of such incidents, consideration must be given to the improvement of the means of closing door openings in the cabs. Whatever form the redesign of cab doors may take, it is not the only feature to consider. Sealing the door openings adequately against the intrusion of the elements and flammable liquids from collisions with trucks, as well as providing a safe means of entrance and exit, should also be among the design requisites.

Mention here is made of a modification adopted in 1963 by the Southern Pacific Co. consisting of squaring off the end of the sloping handle to close the door instead of letting it slam closed. However, even with this modification, there still remain close dimensions between a closing door and the door frame.

EXHIBIT J - INJURIES FROM CAB SEATS, ARM AND BACK RESTS

This exhibit tabulates the next largest source of accidents in the cab, 101, with a like number of injuries. However, in contrast to Exhibit I, practically all these injuries resulted from some defective condition of the cab seat or seat support, arm or back rest. While in most instances this was the result of improper or inadequate repairs, the fact that seats require all too frequent repair attention indicates that a better and safer seat should be designed. Attention should be given in such redesign to securing a seat substantially enough so as to keep it from becoming "projectile" during a collision, as well as providing better security against injury to the occupant during the normal course of his operation of the unit. The proper physical support to the body to prevent undue tiring of the occupant should be the subject of more research.

EXHIBIT K - INJURIES FROM CAB WINDOWS

This exhibit lists two different injury categories, both of which require further attention from designers of control compartments. In the first category, there are 19 cases of injury from cab windows and window mechanism defects. These range from sticking cab windows due to worn runners to window and window panes falling into the cab. All of these are maintenance problems, but the redesign of the cab should incorporate an improved window placement, as well as the consideration of an improved impact resisting glass pane to eliminate the possibility of foreign objects being thrown through the window, of which there are 14 cases listed.

EXHIBIT L - INJURIES FROM STRIKING APPURTENANCES IN CAB

These are not all the cases of such injury but of the 18 cases listed in this category, it would appear difficult, if not impossible to design against all the situations involved in such injuries. However, when the cab of a locomotive is entered, the number of projections and obstacles that exist are so obvious, that even on a standing unit, the occupant must thread his way about. Without going into further detail, there is much room for improvement in the design of the interior of the cab to eliminate the projection of appurtenances from walls and floors to provide a safer environment.

EXHIBIT M - INJURIES FROM FALLING OBJECTS

The 18 cases here listed are by no means a total of such occurrences. The redesign of the cab should provide space for locating such objects as radios and fire extinguishers and other loose apparatus into appropriate recesses.

EXHIBIT N - INJURIES FROM WATER COOLERS

The 15 cases of injuries from water coolers likewise do not include all such accidents. One third of the injuries listed came from broken water bottles, seven cases came from carrying or lifting the water cooler in the cab, while in one case, the entire water cooler and frame turned over. The water cooler impedes free movement of the cab occupants. The redesign of the cab should incorporate the consideration of a more suitable location for this appurtenance.

EXHIBIT O - INJURIES FROM TRIPS ON OBSTRUCTION IN CAB OR NOSE

Again the paucity of cases does not reflect the true number of conditions obtaining in this category. Six of the seven cases occurred on fixed objects in the cab and on the cab floor. These potential sources of injury should be considered in the total cab redesign.

EXHIBIT P - INJURIES FROM TRAP DOORS AND OPENINGS IN CAB FLOOR

It is obvious that accidents such as these are avoidable as, indeed, most of those already reviewed are. However, the small number of these cases again does not indicate the true number of these occurrences. Furthermore, if the cab is to be designed tight against the intrusion of flammables from an outside source, the design should provide for no trap doors in the floor of the cab or nose.

EXHIBIT Q - INJURIES FROM CAB HEATERS

Accidents reported here likewise should not have happened, however, it must be pointed out that a better, more efficient method of heating can be designed into the more ideal cab.

EXHIBIT R - SLIPS AND FALLS ON CAB FLOORS AND STEPS AND NOSE COMPARTMENTS

In practically all the 32 cases reported here some foreign substance on the floor or steps resulted in the slip and fall. This appears to be a matter of "good housekeeping", but there remains a responsibility to design a floor which is more slip resistant and which can be easily cleaned without excessive cost.

EXHIBIT S - INJURIES WITHIN CAB RESULTING FROM BRAKE AND BRAKE EQUIPMENT DEFECTS

These 26 cases (and, likewise, there are more than reported here) are cited as another area for consideration in the cab environment, similar to those listed in Exhibits H, L and O.

EXHIBIT T - FUMES, SMOKE AND GAS IN CAB

The 30 cases reported here, as well as other similar complaints not reaching this report, very properly belong in a study concerning improved cab environment. The proper maintenance of the engine systems is a vital but partial response to this question, as malfunctions can develop enroute that result in the conditions here reported, and which must be avoided.

EXHIBIT U - EYE INJURIES

Several notes should be made of the 66 cases cited in this exhibit. First, all did not result in injury in the standard definition of the term; second, they are from records of only four railroads; and third, they only cover a span of $2\frac{1}{2}$ years. The condition of a foreign particle in the eye cannot always be corrected immediately, and the discomfort to the cab occupant can have an adverse effect on the efficiency and effectiveness of the employee's performance for the ensuring period of service on the trip or shift.

OTHER CONDITIONS

Other conditions were noted during this document search, including the effect of noise on cab occupants. While only two cases of extreme pain to the ears were found, the noise problem is known to exist in all units. The locomotive builders have been making an effort to better insulate the cab compartment against noise, but even so, it is admitted that the noise level in the cab reaches 85 decibels with the heater shut off. This environmental condition warrants further improvement.

Other conditions of cab environment that are more intangible but certainly known to affect the cab occupant adversely are vibration, monotony of sound, etc. The study of cab redesign to provide a safer environment for the locomotive operator must include these physiological and psychological studies by appropriate technology, including the use of a simulator where actual locomotive operations can be repeated and duplicated under varying conditions.

ACKNOWLEDGMENTS

The findings contained in this report are fundamentally the responsibility of Central Technology, Inc. (CENTEC). However, they are the result of efforts expended by a number of people, including the initial guidance provided by staff members of the Bureau of Railroad Safety, Federal Railroad Administration.

Gratitude is due to all. However, the author of this report desires to specifically cite the following for their full cooperation and assistance in this investigation:

Dr. William J. Harris, Association of American Railroads

Mr. Frank Danahy, Association of American Railroads

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Representatives of locomotive builders

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SUMMARY OF FINDINGS

This report covers a tabulation of 858 accident cases in cabs of locomotives from 1961 to present, involving a total of 229 fatalities and 1260 injuries.

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In view of the Locomotive Control Compartment Committee's commitment to a study of the safety of locomotive cabs, this information may well form the basis for the Committee's study of the improvements in cab design. Accordingly, the following observations are deemed in order.

The severity and nature of the accidents in the first part of this report point to the need of designing greater elemental safety in strength and location of the control compartment in locomotive cabs. The second portion of this report emphasizes the necessity of providing more "livable" environmental conditions for the cab interior and elimination of obvious safety hazards. All the situation reviewed need a more

careful consideration, and more research into the possible location of the interior appurtenances. The "rough island" of the control stand is just one example where further research is indicated to improve the cab interior condition.

The causes of the major accidents have not been included to establish culpability or excuse. It is not known to what extent the "lesser" cab environmental hazards may have influenced the locomotive operator's senses of perception, alertness, and response to the conditions that ultimately involved him and the train in the accidents noted. These causes need to be studied, not as mere occurrences, but so as to determine to what extent the physiological and psychological processes of the locomotive cab occupants have been influenced by the actual cab environment. An in-depth research with a locomotive control compartment simulator can accomplish much and is necessary for consideration of cab redesign that will provide the safety sought.

What is needed in an over-all study of the Control Compartment is not a "patch up" job of rebuild, but a carefully researched redesign.

INTRODUCTION

On October 4, 1972, an informal conference was held in the offices of the Bureau of Railroad Safety, Federal Railroad Administration, with representatives of certain railroads, railway labor organizations and associations, locomotive builders and government agencies to discuss various safety aspects of locomotive control compartments. As a result of this meeting, the Bureau of Railroad Safety established the Locomotive Control Compartment Committee for the purpose of continuing the joint efforts of the conference toward improving locomotive safety.

Central Technology, Inc., under the direction and guidance of the Committee, was assigned the task of performing a comprehensive review and analysis of available locomotive cab accident statistics, and preparing a summary report identifying and categorizing the major hazards in locomotive accidents. Specifically, the terms of reference for this assignment were as follows:

"Collect and review available data on cab accidents including the following:

Annual Reports on the Section of Locomotive Inspection,
1961 through 1965.

Accident Report Bulletins, 1961 to present.

National Transportation Safety Board Reports, 1961 to present.

Annual Statistical Summaries, 1961 to present.

Locomotive Inspection Reports, 1961 to present (if applicable).

Identify and extract data relative to locomotive cab accidents and categorize data by accident causes. Prepare a summary report identifying the major hazards in locomotive cabs."

Data contained in this summary report were actually collected and reviewed from the following sources:

1. The published reports from 1961 to present of investigations of railroad accidents by the Bureau of Railroad Safety and the National Transportation Safety Board.

Approximately 300 Accident Report Bulletins were reviewed.

2. Additional data relating to these accidents in the file jackets of the Accident Investigation Branch (Mr. W. McCarthy) of the Office of Railroad Safety.

Numerous jackets were pulled and reviewed. It might be noted that the material in these jackets will be useful in further analysis of accidents reported in this study by the Committee when considering the various elements of cab redesign.

3. The Annual Reports on the Section of Locomotive Inspection (1961 through 1965).

4. T forms of similar accidents from 1965 to the present date.

Here a comment on these forms is deemed appropriate and pertinent. To use these forms for the purpose suggested here was practically an impossible task. To use a print out of these forms relating to these cab accidents would only supply the numerical statistics (as shown on Exhibit G) and these are not classified in the same detail or definition to compare with information drawn from the Annual Reports. For example, there is no additional detail that might be pertinent to the injury. However, probably the more serious, is the ever present possibility of erroneous coding of the occurrences by people not always familiar with happenings on the railroad.

5. The Annual Statistical Summaries from 1961 through 1970 were used in preparing Exhibit A.

6. Documented sources from the following railroads visited for securing supplementary information on cab accidents:

Southern Pacific Transportation Company
Burlington Northern Railroad
Louisville and Nashville Railroad Company
Southern Railway Company

The railroad documents included telegraphic reports of accidents, T forms and files on specific hazards in locomotive cabs. These documents included historical summaries and investigations of the causes of accidents.

Eight days were spent on these railroads, during which time some thousands of such reports were perused for data that could be useful in this report.

COMMENTS ON EXHIBITS

EXHIBIT A

The train accident statistics tabulated in Exhibit A present a background for the study involving head-on, rear-end and side collisions, derailments and train-truck accidents. Over the 10 year period there were a total of 381 rear-end, 251 head-on and 92 side collisions. The documents reviewed in detail in this study cover 85 rear-end, 71 head-on and 27 side collisions or about 25% of the total cases tabulated. There were a total of 38 derailments reviewed also.

However, the catastrophic severity of the cases under study is reflected in the fact that they account for 155 of the total 232 fatalities tabulated or about 67%, which would indicate that the base used for this study is broad enough to certify its validity.

Not under consideration, but certainly of more than passing interest, is the increasing trend over the ten year period in the number of train accidents, casualties and the costs of damage of these accidents. The ratio of train accidents to million locomotive and motor train miles also reflects this, having increased from 4.46 in 1961 to 9.65 in 1970. In view of this, the importance of the consideration of the data in this study for the necessary improvements in locomotive cab design and environment takes on added significance.

EXHIBITS B, C, D, E AND F

These exhibits cover the 282 cases reviewed of head-on collisions, rear-end collisions, derailment/side collisions, derailments and train-truck collisions at highway crossings occurring between January 1961 and June 1972. The documents used included the published reports of investigations of these accidents by the appropriate governmental agencies, some of the file jackets of the FRA investigations, and in some cases, the railroad files themselves. The occurrences are identified as to date, location and the railroad involved. Where known, the impact or closing speed is shown and the type of unit involved. The casualties as to type and location are tabulated. A brief statement regarding damage to the units and cause of the accident completes the data. While the statement of damage is not given in explicit detail, data is sufficient to indicate the vulnerability of the position of the cab occupants in these accidents.

EXHIBIT B - HEAD-END COLLISIONS

This type of accident can be designated generally as having the greatest potential for aggregate destructive forces, with the two

heavy and virtually solid motive power combinations moving towards each other, meeting at substantially high closing speeds. The mass of the trains behind the locomotives tends to compound the kinetic energy through the draft gear compressions at impact.

Seventy-one head-end collisions are tabulated, which resulted in 52 fatalities in locomotive cabs, 7 in caboose (or in train, as passenger train) and 4 from alighting off the units.

The severity of destruction of the impacting units is reflected in the fatalities. The median closing speed (of speeds that range from 7 to 85 mph) at impact, averages out at 35 mph, and 75% of the fatalities in the control compartments in head-on collisions occurred at speeds above this median. In each of these cases, the leading units were generally destroyed or heavily damaged, with the cab most often crushed, demolished or wiped out. In other cases, such potentially movable appurtenances as seats, control stands, etc., were generally found torn loose and lying on the floor, all potential agents of injury and fatality to the cab occupants. In some cases, there have been instances of over-riding of one unit by another or by cars in the train. Where pictures of these collisions were available for review, it was noted that the collision forces generally tended to divert the units laterally. In some instances, where curves were involved, the diversion was noted to have been directed toward the inside of the curve.

EXHIBIT C - REAR-END COLLISIONS

In rear-end collisions the total destructive forces from the kinetic energy of the trains involved may not attain the magnitude of head-on collisions because in most instances one of the trains involved is standing, the nature or direction of these forces is still devastating, not only to the caboose or cars struck, but also to the impacting locomotive. Here the road-switcher type of unit with the short, low hood presents a particularly vulnerable control compartment, which in many of the cases reviewed had been crushed, demolished or wiped out by the over-riding underframe of the caboose or car struck.

Eighty-five occurrences of rear-end collisions were reviewed in which 84 fatalities occurred. Of the instances where fatalities in the cab occurred, 50% are specifically noted to have had an over-ride of the control compartment by the caboose or car. Of the 36 accidents where fatalities in the cab occurred, 29 involved the destruction, crushing and demolishing of the cab, and in the other cases heavy damage to the units was noted.

This vulnerability of the control compartment points to the urgent need for new design considerations to mitigate this danger to cab occupants in rear-end collisions, especially from the destructive over-riding by the other equipment. Compounding this urgency is the significant rising trend of rear-end collisions as indicated in Exhibit A.

EXHIBIT D - DERAILEMENTS/SIDE COLLISIONS

Here are tabulated 27 instances of accidents where the collision forces are of a glancing direction, generally occurring when a passing train strikes a derailed piece of equipment on adjacent track or cutting into a train on the main line while exiting from a siding (or vice-versa). While the ratio of fatalities to incidents here is less proportionate, nevertheless, these occurrences need to be analyzed and considered in any redesign of the locomotive control compartment.

EXHIBIT E - DERAILEMENTS

This tabulation of 39 derailments includes those derailments resulting from trains running at excessive or, in some cases, uncontrolled speeds into restricted curves or turn outs and such cases as trains running into slides, washouts and similar track disturbances.

Obviously, it is not possible to design a cab structure to withstand all manner of destructive force, but, again, an analysis of these accidents also requires consideration in the cab design study.

EXHIBIT F - TRAIN-TRUCK COLLISIONS AT HIGHWAY CROSSINGS

With the ever increasing number and size of highway motor transport truck-trailer combinations, the fatality rate per accident is of special concern. This is particularly true when truck-trailer combinations loaded with flammable contents are involved in collisions. Of the 60 cases reviewed, with a total of 50 fatalities, 18 involved truck-trailers loaded with flammables resulting in 42 fatalities. All the "on ground" fatalities were of cab occupants who had been subjected to the flames and had jumped prior to their death. Only in 4 cases were there any crew members surviving as injured casualties.

To afford more protection to the crew members against collision with a truck loaded with flammables, there is a most urgent need for changes in design of the locomotive control compartment. Much study will be required to improve this situation.

EXHIBIT G - SELECTED FROM TRAIN SERVICE ACCIDENTS TAKEN FROM THE STATISTICAL SUMMARIES OF THE FRA ACCIDENT BULLETINS, NOS. 130 - 139

This exhibit tabulates the casualty statistics from selected causes as indicated by the code numbers, which are defined in the FRA "Rules Governing the Monthly Reports of Railroad Accidents". The causes selected were taken so as to attempt to portray certain environmental conditions in locomotives resulting in casualties. Here it was virtually impossible to match specific hazardous conditions as

gathered from the annual reports or from railroad accident files. Only code Nos. 5106, 5109 and 5117 were sufficiently definitive to be identifiable with data gathered from the various other sources used. The specific cab environment conditions that involved injury and that could be identified from sources other than these Accident Bulletins are detailed in Exhibits "H" through "U", together with some detail as to the nature of cause of the injury. The latter type of information is not available from either the Accident Bulletins or the tapes of key punched T forms.

EXHIBIT H - TRAIN ACCIDENTS - HARD COUPLINGS, ROUGH TRACK AND SLACK ACTION

These accident cases were gathered chiefly from the accident files of the railroads visited, and generally involved more or less minor injuries to the cab occupants as a result of their having come into severe contact with some part or appurtenance of the cab. Identification by date of occurrence and the railroad involved is given, as well as a brief description of the accident, and, where known, the coupling or contact speed is included. In many of the cases, these injuries shown do not classify as reportable injuries under the FRA standard definition.

It is obvious that the cases tabulated are only a fragmentary representation of the total that occur on all the railroads. Only 65 cases resulting in 67 injuries are listed, and practically all have occurred in yard service. The consideration of these accidents is deemed desirable, in view of the increase in the number of yard accidents, as shown in Exhibit A, from 682 in 1961 to 1426 in 1970. Since the injuries shown in Exhibit H have occurred in the cab, they appropriately need to be considered in the study of a redesign of the cab environment.

CAB ENVIRONMENT INVOLVING INJURY EXHIBITS I THROUGH U

These thirteen exhibits list a total of 511 accidents resulting in 520 injuries sustained from coming in contact with various items of cab furniture, fixtures and appurtenances comprising cab environment, including eye injuries, as well as the contamination of the cab air by fumes and gases. Information obtained from the four railroads visited was very useful in augmenting the data from the FRA records. It should be noted that the depth of information secured from the railroads includes many cases that do not classify as reportable injuries as per the FRA definition of the term.

It must also be noted that the cases listed herein are by no means the total number of such incidents. Lack of time precluded visiting more railroads and obtaining greater depth in data collection. However, there is sufficient data to indicate which conditions existing in cabs need to be considered in the redesign of the cab to improve cab environment.

EXHIBIT I - INJURIES FROM CAB DOORS AND LATCHES

Here are tabulated 148 cases, involving 148 instances where the cab occupants sustained injury, mostly to fingers from their being closed in cab doors. In some cases, defective equipment was found to be responsible, while employee carelessness heads the list of causes. But whether it be defective equipment or careless placement of hands and fingers in the doorways that results in the accident, and in view of the large number of such incidents, consideration must be given to the improvement of the means of closing door openings in the cabs. Whatever form the redesign of cab doors may take, it is not the only feature to consider. Sealing the door openings adequately against the intrusion of the elements and flammable liquids from collisions with trucks, as well as providing a safe means of entrance and exit, should also be among the design requisites.

Mention here is made of a modification adopted in 1963 by the Southern Pacific Co. consisting of squaring off the end of the sloping handle to close the door instead of letting it slam closed. However, even with this modification, there still remain close dimensions between a closing door and the door frame.

EXHIBIT J - INJURIES FROM CAB SEATS, ARM AND BACK RESTS

This exhibit tabulates the next largest source of accidents in the cab, 101, with a like number of injuries. However, in contrast to Exhibit I, practically all these injuries resulted from some defective condition of the cab seat or seat support, arm or back rest. While in most instances this was the result of improper or inadequate repairs, the fact that seats require all too frequent repair attention indicates that a better and safer seat should be designed. Attention should be given in such redesign to securing a seat substantially enough so as to keep it from becoming "projectile" during a collision, as well as providing better security against injury to the occupant during the normal course of his operation of the unit. The proper physical support to the body to prevent undue tiring of the occupant should be subject of more research.

EXHIBIT K - INJURIES FROM CAB WINDOWS

This exhibit lists two different injury categories, both of which require further attention from designers of control compartments. In the first category, there are 19 cases of injury from cab windows and window mechanism defects. These range from sticking cab windows due to worn runners to window and window panes falling into the cab. All of these are maintenance problems, but the redesign of the cab should incorporate an improved window placement, as well as the consideration of an improved impact resisting glass pane to eliminate the possibility of foreign objects being thrown through the window, of which there are 14 cases listed.

EXHIBIT L - INJURIES FROM STRIKING APPURTENANCES IN CAB

These are not all the cases of such injury but of the 18 cases listed in this category, it would appear difficult, if not impossible, to design against all the situations involved in such injuries. However, when the cab of a locomotive is entered, the number of projections and obstacles that exist are so obvious, that even on a standing unit, the occupant must thread his way about. Without going into further detail, there is much room for improvement in the design of the interior of the cab to eliminate the projection of appurtenances from walls and floors to provide a safer environment.

EXHIBIT M - INJURIES FROM FALLING OBJECTS

The 18 cases here listed are by no means a total of such occurrences. The redesign of the cab should provide space for locating such objects as radios and fire extinguishers and other loose apparatus into appropriate recesses.

EXHIBIT N - INJURIES FROM WATER COOLERS

The 15 cases of injuries from water coolers likewise do not include all such accidents. One-third of the injuries listed came from broken water bottles, seven cases came from carrying or lifting the water cooler in the cab, while in one case, the entire water cooler and frame turned over. The water cooler impedes free movement of the cab occupant. The redesign of the cab should incorporate the consideration of a more suitable location for this appurtenance.

EXHIBIT O - INJURIES FROM TRIPS ON OBSTRUCTIONS IN CAB OR NOSE

Again the paucity of cases does not reflect the true number of conditions obtaining in this category. Six of the seven cases occurred on fixed objects in the cab and on the cab floor. These potential sources of injury should be considered in the total cab redesign.

EXHIBIT P - INJURIES FROM TRAP DOORS AND OPENINGS IN CAB FLOOR

It is obvious that accidents such as these are avoidable as, indeed, most of those already reviewed are. However, the small number of these cases again does not indicate the true number of these occurrences. Furthermore, if the cab is to be designed tight against the intrusion of flammables from an outside source, the design should provide for no trap doors in the floor of the cab or nose.

EXHIBIT Q - INJURIES FROM CAB HEATERS

Accidents reported here likewise should not have happened, however, it must be pointed out that a better, more efficient method of heating can be designed into the more ideal cab.

EXHIBIT R - SLIPS AND FALLS ON CAB FLOORS AND STEPS AND NOSE COMPARTMENTS

In practically all the 32 cases reported here some foreign substance on the floor or steps resulted in the slip and fall. This appears to be a matter of "good housekeeping", but there remains a responsibility to design a floor which is more slip resistant and which can be easily cleaned without excessive cost.

EXHIBIT S - INJURIES WITHIN CAB RESULTING FROM BRAKE AND BRAKE EQUIPMENT DEFECTS

These 26 cases (and, likewise, there are more than reported here) are cited as another area for consideration in the cab environment, similar to those listed in Exhibits H, L and O.

EXHIBIT T - FUMES, SMOKE AND GAS IN CAB

The 30 cases reported here, as well as other similar complaints not reaching this report, very properly belong in a study concerning improved cab environment. The proper maintenance of the engine systems is a vital but partial response to this question, as malfunctions can develop enroute that result in the conditions here reported, and which must be avoided.

EXHIBIT U - EYE INJURIES

Several notes should be made of the 66 cases cited in this exhibit. First, all did not result in injury in the standard definition of the term; second, they are from records of only four railroads; and third, they only cover a span of $2\frac{1}{2}$ years. The condition of a foreign particle in the eye cannot always be corrected immediately, and the discomfort to the cab occupant can have an adverse effect on the efficiency and effectiveness of the employee's performance for the ensuing period of service on the trip or shift.

OTHER CONDITIONS

Other conditions were noted during this document search, including the effect of noise on cab occupants. While only two cases of extreme pain to the ears were found, the noise problem is known to exist in all units. The locomotive builders have been making an effort to better insulate the cab compartment against noise, but even so, it is admitted that the noise level in the cab reaches 85 decibels with the heater shut off. This environmental condition warrants further improvement.

Other conditions of cab environment that are more intangible but certainly known to affect the cab occupant adversely are vibration, monotony of sound, etc. The study of cab redesign to provide a safer environment for the locomotive operator must include these physiological and psychological studies by appropriate technology, including the use of a simulator where actual locomotive operations can be repeated and duplicated under varying conditions.

STATISTICAL SUMMARY FROM FRA ACCIDENT BULLETINS NOS. 130 - 139

TRAIN ACCIDENTS, CASUALTIES, AND DAMAGE

	1961	1962	1963	1964	1965	1966	1967	1968	1969	1970	Total for 10 years
Total Train Accidents	4,149	4,378	4,822	5,317	5,967	6,793	7,294	8,028	8,543	8,095	63,386
Total Collisions	982	999	1,092	1,229	1,380	1,552	1,552	1,727	1,810	1,756	14,049
Rear-end collisions	37	39	33	44	31	32	24	36	57	48	381
Head-on "	14	15	17	34	34	20	30	31	29	30	251
Broken train "	24	28	38	36	27	38	38	40	41	30	328
Side or raking "	123	81	98	76	86	113	107	88	131	94	997
At railroad crossings "	5	5	10	5	13	6	12	15	8	13	92
Trains with cars not in train collisions	34	13	19	30	26	25	33	9	42	23	254
Switching "	682	740	841	956	1,081	1,240	1,204	1,427	1,409	1,426	11,006
Not elsewhere classifiable	63	78	46	59	82	78	74	85	93	82	740
Deraillments	2,671	2,830	3,170	3,399	3,869	4,447	4,960	5,487	5,960	5,602	42,395
Other Train Accidents	496	549	560	689	718	794	812	814	773	737	6,942
Employees killed - collisions	5	15	5	22	19	11	14	2	34	29	156
" - deraillments	5	14	7	6	5	8	5	3	9	14	76
" - other											
train accidents	7	7	4	9	9	2	3	3	2	3	49
Total employees killed	17	36	16	37	33	21	22	8	45	46	281
Employees injured - collisions	126	174	195	224	217	150	179	192	226	171	1,854
" - deraillments	193	217	290	227	249	215	241	199	217	164	2,212
" - other											
train accidents	34	25	35	58	39	60	38	45	52	28	414
Total employees injured	353	416	520	509	505	425	458	436	495	363	4,480
Damage to railroad property	50,431,362	56,364,141	70,472,272	72,059,532	85,531,073	98,960,779	96,650,250	114,344,312	129,547,904	121,625,278	895,986,903
From collisions	6,004,842	7,949,783	7,929,008	11,852,951	14,079,575	12,323,197	11,365,498	10,993,856	22,139,356	16,838,676	121,476,742
From deraillments	41,623,543	46,538,902	59,234,609	57,375,658	68,580,783	82,479,433	82,068,519	99,472,188	103,782,379	101,228,437	742,384,451
From other train accidents	2,802,977	1,875,456	3,308,655	2,830,923	2,870,715	4,158,149	3,216,233	3,878,268	3,626,169	3,558,165	32,125,710
Damage to equipment	41,485,184	45,027,489	59,260,301	59,294,549	70,517,331	81,881,496	79,460,285	93,747,609	106,837,018	101,699,112	739,205,372
From collision	5,763,548	7,555,062	7,583,522	11,251,299	13,457,077	11,720,673	10,817,452	10,390,420	20,780,204	15,985,628	115,309,885
From Deraillments	33,147,988	35,812,493	48,566,743	45,555,401	54,648,676	66,654,004	65,785,509	80,047,390	83,156,539	82,767,295	596,142,048
From other train accidents	2,568,648	1,659,934	3,110,026	2,487,849	2,411,578	3,506,819	2,857,324	3,309,699	2,900,275	2,946,189	27,758,341
Damage to track and road bed	8,946,178	11,336,652	11,211,971	12,764,983	15,013,742	17,079,283	17,189,965	20,596,703	22,710,886	19,926,166	156,776,529
From collisions	236,294	394,721	345,486	601,552	622,498	602,524	548,046	603,436	1,359,152	853,048	6,166,857
From deraillments	8,475,555	10,726,409	10,667,956	11,870,557	13,932,107	15,825,429	16,683,010	19,424,790	20,605,840	18,461,142	146,846,203
From other train accidents	234,329	215,522	198,629	343,074	459,137	651,330	358,909	568,569	725,894	611,976	4,367,369
Loco and motor train mile (millions)	931	943	945	991	930	941	895	876	864	839	9,155

Exhibit B-1

RS = Road Switcher Type Units
CB = Car Body Type Units
SW = Switcher Units

Case No.	Date	Railroad	Location	Type of Units	Closing Speed			Location Killed			Location Injured			Remarks/Cause	Document Source
					cab	caboose	ground	cab	caboose	ground					
1	6-15-72	L&N	Birmingham, AL	RS	15	0	0	0	0	0	1	Failure to control speed in yard limits	RR		
2	5-24-72	BN	Douglas, IL	RS	60	4	0	0	0	0	0	Failure to obey Meet Order. Both lead units destroyed.	RR		
3	5-14-72	BN	Paxton, OR	RS	33	0	0	0	0	0	2	Failure to obey Meet Order and control train per signal. Heavy damage to units.	RR		
4	4-14-72	BN	Elmwood, IL	RS	32+	0	0	0	0	2	2	Failure to control speed in yard limits. Heavy damage to units.	RR		
5	3-21-72	L&N	Fairy, GA	RS	9	0	0	0	1	0	0	Failure to comply with signal aspects	RR		
6	11-12-71	BN	Camas, WA	SW&RS	?	0	0	0	2	0	0	Failure to control speed in yard limits	RR		
7	9-18-71	BN	Belton, MT	CB&RS	15+	1	0	0	1	1	1	Failure to obey Meet Order and control train per signal. Units badly damaged.	RR		
8	6-2-71	BN	Hillyard, WA	?	?	0	0	0	3	0	0	Failure to control Roundhouse move	RR		
9	5-11-71	BN	Sheffels, MT	RS	78	4	0	0	0	0	0	Dispatching failure - units destroyed	4178		
10	5-3-71	BN	Bellingham, WA	SW&RS	20	0	0	0	3	0	0	cab and superstructure torn off	RR		
11	3-19-71	C&NW	Palmer, MN	RS	25	0	0	1	0	3	3	Failure to control speed in yard limits	FRA#13		
12	12-31-70	BN	Columbia Fall, MT	RS	20	0	0	0	0	2	1	Engineer & brakeman dozed	RR		
13	11-8-70	SOU	Columbia, SC	RS	7	0	0	0	2	0	0	Failing to observe Meet Order - Heavy damage	RR		
14	10-25-70	CLFD	Green Mtn., NC	CB	45	2	0	0	0	0	1	Failure to comply with signal aspect	FRA		
15	10-20-70	FI	Raytown, MD	?	25	1	0	0	0	0	0	Failure to control train - units destroyed	FRA		
16	10-22-70	BN	Joder, NB	RS	30+	0	0	0	1	0	0	Malicious tampering with siding switch	RR		
17	9-8-70	BN	Everett, WA	SW	15	0	0	0	2	0	0	Heavy damage to units	RR		
18	9-5-70	BN	Wenatchee, WA	SW&RS	10	0	0	0	1	0	0	Failure to comply with signal aspect	RR		
19	9-5-70	BN	Vaughn, MT	RS	15	0	0	0	0	0	2	Failure to comply with signal aspect	RR		
20	8-19-70	N&W	Pembroke, VA	RS	40+	2	0	0	0	0	1	Failure to control train per signal	4171		
21	8-25-70	N&W	Finney, VA	RS	37	2	0	0	1	0	0	Failure to control train per signal - 2nd unit overrode jet unit demo-lished cab	4175		
22	6-6-70	BN	Newport, WA	CB&RS	16	0	0	0	4	?	0	Failure to control train per signal - cab sheared OFF	4169		
23	6-3-70	EJ&E	Cavanaugh, IN	?	15	0	0	0	?	0	0	Switch changed in front of train - little damage	FRA		
24	5-20-70	WP	Keddie, CA	RS	12	0	0	0	4	0	0	Failure to control train per signal - Heavy damage	FRA		
25	5-14-70	BN	Chicago, IL	RS	10	0	0	0	?	?	0	Failure to control speed in yard limits	FRA		
												Yard accident	RR		

RS = Road Switcher Type Units
 CB = Car Body Type Units
 SW = Switcher Units

Case No.	Date	Railroad	Location	Type of Units	Location Killed			Location Injured			Remarks/Cause	Document Source
					Closing Speed	Ground	caboose	cab	caboose	Ground		
26	2-27-70	CR of NJ	"Wt" Tower, NJ	?	?	0	0	0	3	0	Failure to control speed in interlocking	FRA
27	1-14-70	C&N	Sturgis, SD	RS	10	0	0	0	0	1	Failure to control speed in yard limits	FRA
28	11-3-69	C&O	Walkerford, VA	RS	82	1	0	0	3	0	Engineer asleep Brakeman away - both lead units destroyed	4157
29	9-7-69	IC	McManus, LA	RS	80	3	1	0	1	3	Dispatched Meet Order after train passed - units destroyed	4155
30	5-13-69	L&N	Anherst, TN	RS	57	1	0	0	0	2	Failure to obey Meet Order - Unit destroyed	RR
31	1-17-69	IC	Indian Oaks, IL	CB&RS	70	3	0	0	0	3	Improper use of radio, failure to control speed - units destroyed	4149
32	8-5-68	SCL	Winter Haven, FL	CB	50	0	0	0	0	2	Failure to control train per signal - CTC out	4148
33	12-21-67	UP	Wamego, KA	CB&RS	65	3	2	0	0	3	Engineer passed out - RS units destroyed - CB unit heavily damaged	4142
34	12-8-67	L&A	Essen, LA	CB	23	2	2	0	0	0	Failure to control train per signal - units heavily damaged	4139
35	8-29-67	EL	Passaic, NJ	RS	33	3	0	0	3	0	Train proceeding against traffic without authority - units heavily damaged	4134
36	4-6-67	MKT	Caphead, TX	SW&RS	35	0	0	0	5	0	Failure to comply with yard rules - units heavily damaged	4119
37	3-3-67	SOU	East Spartanburg, SC	CB	15	0	0	0	3	0	Failure to comply with signals - units considerably damaged	4114
38	11-1-66	EL	Dover, NJ	EL, MU&CB	85	1	0	0	0	2	Failure to secure unattended units - diesel unit destroyed	4108
39	10-24-66	L&N	Strawberry, KY	RS	8	0	0	0	1	0	Yard accident	RR
40	9-15-66	EL	Garrettsville, OH	CB&RS	17	0	0	0	4	2	Failure of oral authority by dispatcher to work train - CB overrode RS unit	4101
41	7-21-66	NP	Spokane, WA	RS	43	0	0	0	6	3	Failure to control train per signal - lead units heavily damaged	4098
42	7-13-66	SCL	Cherryville, NC	RS	63	1	0	0	3	0	Failure to obey Meet Order - lead units each train destroyed	4095
43	6-2-66	MILW	Green Bay, WI	CB	Slow	0	0	0	4	4	Failure to obey Meet Order - slight damage	4086
44	3-20-66	GM&O	Burksville, IL	RS	23	0	0	1	0	0	Failure to obey Meet Order - lead units destroyed	4078
45	3-7-66	GN	Buelow, MT	CB	78	2	0	0	2	0	Failure to control train per signal - lead units destroyed	4081
46	12-26-65	CR of NJ & IV	Laurel Run, PA	RS	37	0	0	0	3	3	Failure to control train per signal - lead CNJ unit telescoped	4075

Exhibit B-3

RS = Road Switcher Type Units
 CB = Car Body Type Units
 SW = Switcher Units

Case No.	Date	Railroad	Location	Location Killed				Location Injured				Remarks/Cause	Document Source
				Type of Units	Closing Speed	Car	caboose	Ground	cab	caboose	Ground		
47	12-6-65	SP	Coalinga, CA	RS	40	0	0	0	5	4	0	Failure to use caution in yard limits - collided on trestle - both units fell CFF & destroyed	4069
48	12-5-65	C of GA	Waynesboro, GA	RS	30	1	0	0	1	0	6	Failure to deliver train order - units destroyed - cab sheared off	4064
49	8-28-65	MILW	Redwing, MN	SW&CB	28	0	0	0	3	0	0	Yard move fouling main track - units heavily damaged	4058
50	8-20-65	MP	St. Louis, MO	SW&CB	10	0	1	0	2	0	0	Failure to control train per signal - slight damage	4057
51	8-19-65	PA	Riegelsville, NJ	RS	32	0	0	0	4	0	0	Overlapping authority to occupy block - heavy damage to units	4056
52	1-11-65	B&O&EL	Sterling, OH	CB&RS	54	4	1	0	0	1	0	Failure to control train per signal - units destroyed	EXP 245
53	11-12-64	LI	Far Rockaway, NY	EL.&Cars	10-	0	0	0	0	4	0	Failure to control train per signal - Heavy damage	4030
54	10-15-64	WAB	Griggsville, IL	CB&RS	?	1	0	0	1	0	0	Failure to obey Meet Order - units heavily damaged	4027
55	9-27-64	CB&Q	Montgomery, IL	CB	52	4	0	0	2	0	0	Failure of interlocking system to control train - lead units destroyed	EXP 244
56	8-16-64	B&M	Winchester, MA	RDC	15	0	0	0	2	4	0	Failure to deliver train order - control compartments crushed	4020
57	7-13-64	NYC	Lewisburg, OH	RS	35	0	0	0	6	4	0	Failure to obey Meet Order - lead units destroyed	4019
58	6-11-64	L&N	Kennesaw, GA	CB	10	1	0	0	3	1	0	Failure to control train per signal - units turned over	4016
59	5-21-64	PA	Landover, MD	SW&RS	35	1	0	0	5	0	0	Failure to control train per signal - units heavily damaged	4014
60	5-14-64	PA	Orleans, NY	RS	46	3	0	0	3	2	0	Train occupying block without authority - units destroyed	4013
61	6-21-63	SOU	Eufola, NC	CB	?	0	0	1	0	0	2	Failure to obey Meet Order - lead units destroyed	3998
62	4-22-63	CB&Q	Bigelow, MD	CB	23	0	0	1	1	2	0	Switch not returned to normal position	3990
63	12-28-62	EL	Kent, OH	SW&CB	50+	0	0	0	2	1	0	Failure to control train per signal	3973
64	9-4-62	PA	Temple, PA	SW&RS	?	0	0	0	8	2	0	Failure to control speed in yard limits 0 yard loco heavily damaged	3969
65	4-27-62	T&P	Texarkana, TX	CB	29	0	0	0	2	0	0	Yard move on intersection without authority - units heavily damaged	3954
66	4-4-62	KCS	Harmar, PA	CB&RS	46	0	0	0	3	2	1	Failure to control train per signal - lead units destroyed	3947
67	10-14-61	IC	Woodbine, IO	RS	30	0	0	0	0	0	4	Failure to obey Meet Order - units heavily damaged	3928
68	7-9-61	B&O	Bridgeville, OH	CB&RS	55	1	0	0	?	?	?	Failure to obey Meet Order - units heavily damaged	3921

Exhibit B-4

RS = Road Switcher Type Units
 CB = Car Body Type Units
 SW = Switcher Units

Case No.	Date	Railroad	Location	Location Killed				Location Injured				Remarks/Cause	Document Source
				Type of Units	Closing Speed	q	caboose	ground	q	caboose	ground		
69	7-24-61	C of GA	Griswold, GA	CB&RS	18	0	0	0	3	1	0	Inferior train delayed in switching to clear track - considerable damage to units	3922
70	4-20-61	FEC	Canal Pt., FL	RS	?	0	0	0	6	2	0	Failure to control speed in yard limits - units destroyed - 2 units that were overridden by cars had no cab occupants	3913
71	1-23-61	EL	Orange, NJ	RS	27	0	0	0	2	0	0	Failure to provide adequate protection for locomotive - considerable damage to units	3905
71 Cases						52	7	4	137	70	39		

TRAIN ACCIDENTS

Exhibit C-1

Rear End Collisions (Also Cars to Locomotives)

RS = Road Switcher Type Units
CB = Car Body Type Units
SW = Switcher Units

Case No.	Date	Railroad	Location	Type of Units	Location Killed			Location Injured			Remarks/Cause	Document Source
					Closing Speed	Caboose	Ground	Cab	Caboose	Ground		
72	2-26-72	SP&UP	Los Angeles Div.	SW	8	0	0	1	0	0	Failure to control yard move	RR
73	2-19-72	SP	Oregon Div.	RS	?	0	0	1	0	0	Car rolled down on helper eng.	RR
74	9-18-71	SOU	Shelby, NC	RS	10	0	0	1	0	0	Engine struck standing cars	RR
75	7-16-71	Burl-Nor	Deschutes, OR	RS	53	2	0	0	0	1	4 cars lumber ran away struck eng. of approaching train-failure to secure cars - unit destroyed.	RR
76	6-29-71	Burl-Nor	Guernsey, WY	RS	8	0	0	2	2	0	Failure to operate train per signal indicated	RR
77	5-11-71	Burl-Nor	Durham, IA	RS	?	0	0	0	0	2	Engineer & Brakeman jumped from locomotive at 15 mph fearing impending collisions	RR
78	3-28-71	Burl-Nor	Sheridon, WY	RS	13	2	0	1	1	0	Failure to control train speed in yard - cab badly damaged	NTSB 724
79	3-26-71	Penn.Cent.	North Manchester, IN	RS	30	3	0	1	0	0	Caboose overrode unit - demolished cab	FRA 12
80	3-1-71	Louis&Wash	Atlanta, GA	SW	15	0	0	0	0	2	Cut of cars rolled out against yard engine	RR
81	1-30-71	DM&IR	Duluth, MN	RS	44	1	0	1	0	1	Train out of control-engineer mishandled air brakes- heavy damage to unit	4177
82	12-22-70	SOU	Russellville, AL	RS	10	0	0	1	0	0	Failure to control train	RR
83	11-3-70	Burl-Nor	Tecumsek, NB	RS	45	2	0	1	1	0	Failure to control train per signal indication - cab destroyed	FRA
84	10-23-70	B&O & MILW	Phoenix, IL	SW&RS	25	0	0	1	1	1	Excessive speed in yard limits	FRA
85	10-24-70	SOU	Kings Mtn., KY	RS	35	0	1	0	2	1	Rear end & side collision (3 trains) failure to comply with signals indication	4174
86	9-13-70	IL Cent.	Dongala, IL	RS	25	0	0	1	0	1	Failure to comply with signal aspect	FRA
87	10-9-70	Reding & Cent. RR of NJ	Langhorne, PA	RS	36	2	1	0	2	1	Caboose overrode first unit-demolished cab - failure to comply with signals indication	4176
88	9-23-70	Kan.Cty.Sou.	Zwolle, LA	CB	27	2	0	0	0	0	Failure to control train speed per train order - lead unit overturned - cab badly damaged	4172
89	9-8-70	IL Cent. & Harbor Belt	Riverdale, IL	RS	25	2	0	1	0	1	Caboose overrode first unit - demolished cab - failure to protect move	FRA
90	8-21-70	Penn.Cent.	Ravenna, OH	RS	27	0	0	0	2	0	Improperly wired control circuit	
91	7-17-70	SOU	Booneville, IN	RS	10	0	0	0	4	0	Failure to control train speed	RR
92	6-14-70	Penn.Cent.	Massillon, OH	RS	25	1	0	0	0	3	Caboose overrode first unit - demolished cab - failure to comply with signal indication	4170
93	6-3-70	St.L & SF	Oluster, OK	RS	35	4	0	0	0	0	Cut of Cars released maliciously - ran into approaching train - cab sheared by cars	FRA

Exhibit C-2

RS = Road Switcher Type Units
 CB = Car Body Type Units
 SW = Switcher Units

Case No.	Date	Railroad	Location	Type of Units	Location Killed			Location Injured			Remarks/Cause	Document Source
					Closing Speed	Caboose	Ground	Caboose	Caboose	Ground		
94	4-26-70	C.R.I.&F.	Ramona, KN	RS	5	0	0	2	0	0	Failure to obey Meet Order and comply with signal aspect	FRA
95	4-11-70	SOU	Bynum, AL	RS	15	0	0	2	1	0	Failure to control train per signal aspect	RR
96	4-9-70	Louis&Nash	McGehee, AL	RS	15	0	0	2	0	0	Light engines turned into siding striking caboose of train in siding - failure to comply with signal aspect	RR
97	3-25-70	C.R.I.&P	Union, MO	RS	13	1	0	0	0	1	Caboose overrode front unit demolished cab	4168
98	3-25-70	Burl-Nor	Lakeyard, OR	SW	10	0	0	1	0	0	Yard locomotive struck by freight train backing into wrong track - brakeman threw wrong switch	RR
99	2-17-70	Union Pac.	Grand Island, NB	RS		0	0	1	0	3	Failure to comply with signal aspect	FRA
100	1-16-70	SOU	Chatahoochee, GA	RS	38	0	0	3	0	0	Train struck ballast regulator	RR
101	11-11-69	Penn.Cent	New Carlisle, IN	CB	50	1	0	1	1	0	Failure to provide flag protection for preceding train	4154
102	10-26-69	SOU	Leadvale Jct.	RS	10	1	0	1	0	0	Caboose overrode 1st unit demolished cab - flagging failure & failure to control train	4160
103	9-26-69	IL Cent	Riverdale, IL	RS	60	2	1	1	2	0	Car overrode 1st unit - demolished cab - engineer & brakeman following train asleep	4163
104	9-21-69	Nor&West	Colby, OH	RS	24	0	1	0	3	0	Lead unit overturned - failure to control speed per signal indications	4165
105	9-20-69	Louis&Nash	Elmore, AL	RS	8	0	0	1	0	0	Engine and caboose backed into engine on Wye	RR
106	9-14-69	Chi&No.West	Burtonville, IL	RS	23	2	0	1	1	0	Caboose overrode 1st unit, tearing off cab - excessive speed in yard limits	4156
107	8-18-69	Penn.Cent.	Wellington, OH	RS	6	2	0	1	0	0	Caboose overrode 1st unit, destroying cab - flagging failure and engineer failed to control train	4158
108	8-10-69	Louis&Nash	Grant Park, IL	RS	48	0	0	1	1	0	Cars rolled out on main track in front of approaching train	RR
109	6-6-69	Great Nor	Marysville, WA	RS	63	2	0	0	2	0	Gondola overrode lead unit, crushing cab - engineer of following train unconscious	4152
110	10-10-68	Burl-Nor	Winfield, MO	RS	8	0	0	1	0	0	Failure to control speed of yard move	RR
111	11-13-67	IL Cent.	Marks, MS	RS	28	0	0	0	0	2	Yard move struck stopped freight train - failure to control speed in yard limits	4153
112	10-29-67	Miss.Pac.	Norfolk, AR	RS	28	0	0	1	0	1	freight train turned into cars on siding by malicious tampering with switch	4156

Exhibit C-3

RS = Road Switcher Type Units
 CB = Car Body Type Units
 SW = Switcher Units

Case No.	Date	Railroad	Location	Type of Units	Closing Speed	Location Killed			Location Injured			Remarks/Cause	Document Source
						caboose	ground	cab	caboose	ground	cab		
113	10-4-67	Penna	Huntington, PA	RS	25	1	0	1	1	0	0	1st 2 units derailed & heavy damage flagging failure & failure to operate per signal aspect	4135
114	6-3-67	Miss.Kan-Tex	Elgin, TX	RS	21	2	0	0	0	1	0	Cut of cars rolled out on main line into approaching train - unit destroyed - failure to set handbrakes & running too fast in yard limits	4121
115	5-21-67	Balt&Ohio	East Dillard, OH	RS	29	0	0	5	0	0	0	Switch tampered with maliciously & train entered siding into cut of cars	4120
116	1-13-67	Nor&West	Newell, ILL	RS	37	1	0	1	0	0	0	Caboose overrode 1st unit, destroying cab, failure to operate yard move per rules & failure to control speed	4107
117	11-18-66	Term RR St. L.	St. Louis, MO	RS	10	1	0	0	0	1	0	Lead unit destroyed when struck caboose of train - failure to provide protection & to operate train under control	4105
118	10-16-66	Chi&No.West	Kilkenny, MN	?	28	0	0	4	0	0	0	Failure by carrier to protect rear of derailed train against approaching diesel units	4100
119	6-20-66	Chi&No.West	Lowton, IO	RS	30	0	0	2	0	0	0	Failure to flag and failure to operate train per signal aspect	4097
120	5-28-66	Louis&Nash	Falmouth, KY	RS	20	0	0	0	0	3	0	Failure to control train speed	RR
121	3-25-66	C.R.I.&P. Manly, IO		CB	23	1	0	2	0	0	0	Failure to restore switch to normal position - passenger train diverted into cars on siding - unit heavily damaged	4083
122	2-10-66	Chi&No.West	Franklin Grove, IL	RS	13	1	0	1	0	2	0	Failure to protect & failure to comply with signal aspect - unit heavily damaged	4076
123	2-10-66	Chi&No.West	Proviso, IL	RS	over 23	3	0	0	2	1	0	Failure to comply with signal aspect and rules - cab destroyed	4077
124	2-2-66	Penna.	Johnstown, PA	RS	39	0	0	2	1	0	0	Failure to comply with Signal aspects	4082
125	12-26-65	Cent of GA	Tenville, GA	CB	23	0	0	2	0	0	0	Failure to line switch in normal position - passenger train diverted to cars on aux. track	4068
126	12-24-65	Tex & Pac & M.K. & T.	Argyle, TX	RS	62	2	2	1	1	0	0	Failure to protect reverse move to T&P train against approaching MKT train - unit destroyed	4072
127	9-11-65	C.R.I &P.	Marseilles, IL	RS	9	1	0	0	0	0	0	Failure to control speed of engines returning to train - cab demolished	4061
128	2-6-65	A.T.&S.F.	Houck, AZ	RS	25	1	0	1	0	0	0	Failure to comply with signal aspects - unit destroyed	4040

Exhibit C-4

RS = Road Switcher Type Units
CB = Car Body Type Units
SW = Switcher Units

Case No.	Date	Railroad	Location	Type of Units	Location Killed			Location Injured			Remarks/Cause	Document Source
					Closing Speed	caboose	Ground	cab	caboose	Ground		
129	1-7-65	Sou.Pac.	Emigrant Gap, CA	CB	31	0	0	6	3	0	False clear signal indication	4035
130	11-30-64	Gr. Nor.& C.&N.W.	St. Paul, MN	SW	28	1	0	1	2	0	Failure to control train- cab crushed	4033
131	11-14-64	Balt&Ohio	Lebanon, IL	?	25	0	0	3	0	0	Failure to comply with signal aspects	4031
132	11-3-64	NY Cent.	Jersey Shore, PA	CB	25	0	1	1	2	0	Locomotive backed caboose into own train at excessive speed	4028
133	11-1-64	Penna.	Edgeworth, PA	RS	9	0	0	0	2	0	Failure to comply with signal aspects	4034
134	9-4-64	Seaboard A.L.	Hamlen, NC	SW	Poss. 45	1	0	3	0	0	Train out of control, Failure to couple air - unit heavily damaged	4024
135	7-2-64	Penna.	Corliss, PA	CB	18	3	0	0	1	0	Car overrode lead unit, crushing cab - failure to comply with signal aspects	4018
136	6-7-64	Louis&Nash										
137	3-22-64	Penna.	Massillon, OH	RS	42	1	0	2	0	0	Failure to comply with signal aspects- unit destroyed	4005
138	8-16-63	New Haven	Bethel, CN	RDC	23	0	0	1	1	0	Conductor failed to return switch to normal, diverting passenger train into freight train on siding	4003
139	7-21-63	Chi&No.West	Kennard, NB	RS	15	0	1	3	1	0	Failure preceding train to flag	4001
140	1-25-63	Chi&No.West	Evanston, IL	CB	?	0	0	2	2	0	Inadequate protection and failure to comply with signal aspects	3985
141	12-16-62	NY Cent.	South Bend, IN	RS	20	0	2	0	2	0	Failure to protect stopped train & failure to control speed in yard limits	3978
142	11-7-62	NY Cent.	Pan, OH	RS	20	0	1	0	1	0	Failure to provide protection for stopped train	3975
143	10-31-62	Miss.Pac.	Pine Bluff, AR	RS	?	1	0	1	3	0	Cab crushed - failure to control speed in yard limits	3930
144	10-25-62	Chi&No.West	Alton, IO	CB	20	0	0	1	1	0	Failure to protect standing train	3971
145	9-10-62	IL Cent.	Crenshaw, MS	RS	2	0	0	0	0	1	Caboose overrode 1st unit, destroying cab - failure to protect standing train	3967
146	8-14-62	Penna.	Atglen, PA	El.Units Over 40	2	0	0	1	2	0	Failure to control speed in occupied block - heavy damage to loco	3961
147	8-13-62	Chi&No.West	Waukegon, IL	CB	18	0	0	0	0	0	Failure to protect and false clear signal	3965
148	7-6-62	A.T.&S.F.	Syracuse, KA	CB	71	0	0	2	0	0	Passenger train struck unprotected M.W. Units	3957
149	7-5-62	NY Cent.	No. Tonawanda, NY	RS	27	0	2	2	0	0	Yard move against current of traffic without authority	3960
150	6-16-62	NY Cent.	West Carrollton, OH	CB	38	2	0	0	0	0	Failure to protect stopped train & failure to control train speed -	3956

Exhibit C-5

RS = Road Switcher Type Units
 CB = Car Body Type Units
 SW = Switcher Units

Case No.	Date	Railroad	Location	Type of Units	Location Killed			Location Injured			Remarks/Cause	Document Source	
					Closing Speed	q	caboose	Ground	cab	caboose			Ground
151	5-9-62	Penna.	Vance Mill Jct., PA	RS	10	1	0	0	1	0	0	Malicious tampering of switch - gondola overrode front of unit destroying cab	3950
152	5-6-62	Balt.&Ohio	Mosgrove, PA	CB	35	0	0	0	2	1	0	Failure to control speed of train in occupied block	3949
153	2-15-62	New Haven	Canton Jct., MA	RDC	?	1	0	2	3	0	0	Failure to control speed of train in occupied block - control compartment crushed	3944
154	1-9-62	Chi&No.West	Agnew, IL	CB	40	0	1	0	2	1	0	Failure to protect stopped train & failure to comply with signal aspects	3941
155	11-8-61	SOU Line	Bald Eagle, MN	RS	25	0	0	0	2	0	0	Inadequate protection of preceding train	3934
156	6-9-61	SOU Pac.	Los Angeles, CA	SW	70	2	0	0	0	0	0	Car of lumber not secured rolled out on main line down grade striking yard engine - unit destroyed	3915
85 Cases					63	13	8	102	45	28			

TRAIN ACCIDENTS

Derailments/Side Collisions

RS = Road Switcher Type Units
 CB = Car Body Type Units
 SW = Switcher Units

Case No.	Date	Railroad	Location	Type of Units	Location Killed				Location Injured				Remarks/Cause	Document Source
					Closing Speed	Car	Caboose	Ground	Cab	Caboose	Ground			
157	12-25-70	Penn.Cent.	Versailles, OH		37	0	0	0	3	1	0		Broken journal - train struck jackknifed car & derailed - considerable damage to unit	
158	3-28-70	Sou.Pac.& West Pac.	Floka, NV	RS	50	2	0	0	0	1	0		Train crew failure to hear radio message for emergency brake - lead unit overturned & cab badly damaged	4166
159	2-17-70	A.T.&S.F. Union Pac.	Fullerton, CA	YS&RS	40	0	0	0	1	0	1		U.P. crew left caboose & car across S.F. tracks - units considerably damaged	4173
160	2-1-70	Nor&West	Conotton, OH	RS	20	0	0	0	2	0	1		Failure to comply with signal aspects	
161	4-18-69	Penn-Cent	Ridgeway, OH	RS	44	1	0	0	0	0	0		Inadequate securing of boxcar end door	4162
162	3-24-68	C&N.W.& Milw.	Elberon, IO	RS	61	1	0	0	0	2	0		Engineer failed to stop - units destroyed - engineer killed in cab	4146
163	8-12-67	Del&Hud.	Baldston Spa, NY	RS	27	0	0	0	2	1	0		Failure to comply with signal aspects units destroyed	4125
164	4-28-67	NY Cent.	Harbor Creek, PA	CB	25	0	0	0	2	1	0		Broken wheel on car of M&E train - freight train struck derailed cars - units considerably damaged	4115
165	2-22-67	Louis&Nash	Highland Park, KY	SW&RS	15	0	0	0	4	0	0		Derailed equipment struck standing switch engine - some damage to unit	RR
166	7-20-66	Milw	Whitman, MN		61	0	0	0	5	1	0		Lumber shifted & derailed cars which were struck by passing train - units derailed & heavily damaged	4099
167	5-18-66	NY Cent.	Jordan, NY	CB	50	0	0	0	1	0	0		Bad order car fouled adjacent track - units derailed	4092
168	8-2-65	Nor&West	Liberty Center, IN	RS	46	0	1	0	0	3	0		W.B. train entering siding struck by E.B. train on main track - units badly damaged and D.H. caboose behind engine destroyed - E.B. train failure to obey Meet Order	4054
169	7-29-65	Mo.Pac.	F.I. Jct., IL	RS	58	1	0	0	1	0	0		S.B. train struck N.B. train at 37th car - failure S.B. train to comply with signal aspects - units destroyed	4049
170	7-5-65	IL Cent.	Halls, TN	RS&CB	19	0	1	0	0	0	0		Freight train backed into passenger train entering siding on wrong signal	4047
171	3-6-65	Nor&West	Montvale, VA	RS	66	0	0	0	2	0	1		E.B. train struck W.B. train entering siding at 57th car - angle cocks between units not open, train out of control on downgrade - lead unit destroyed	4051
172	5-2-64	Gr.Nor	Wayzata, MN	CB	65	0	0	0	2	1	0		38th car of freight train derailed by broken coupler, fouled adjacent track derailling passenger train-units heavily damaged	4011

Exhibit D-2

RS = Road Switcher Type Units
 CB = Car Body Type Units
 SW = Switcher Units

Case No.	Date	Railroad	Location	Type of Units	Location Killed				Location Injured				Remarks/Cause	Document Source
					CB	Car	Locomotive	Ground	CB	Car	Locomotive	Ground		
173	3-15-64	New Haven	So. Norwalk, CT	CB	0	0	0	0	1	0	0	0	2nd car of E.B. train derailed by defective track, fouled adjacent track derailling E.B. passing train - units badly damaged	4010
174	3-1-64	Penna.	Hartford City, IN	RS	1	0	0	0	3	0	0	0	Shifted leading on 11th car of W.B. train struck E.B. locomotive units on right side - superstructure and cars demolished train fouling adjacent track which derailed passing train - units derailed & damaged	4008
175	12-23-62	Erie-Lack	Windham, OH		0	0	0	0	4	4	0	0	Broken body CTR plate derailed train fouling adjacent track which derailed passing train - units	3972
176	11-20-62	Balt&Ohio	Ravenna, OH		0	0	0	0	0	1	0	0	Broken spring plank derailed 9th car fouling adjacent track & striking passing train - units heavily damaged	3952
177	11-10-62	IL Cent.	Wilderman, IL	CB	0	0	0	0	3	1	0	0	Passenger train passed stop signal and entered turn out into main track & freight train - units turned over & heavily damaged	3976
178	10-11-62	St.L&S.F.	Lamar, MD		0	0	0	0	0	1	0	0	Freight train making switch move shoving cars past stop signal & into another freight train - units considerably damaged	3968
179	2-28-62	Penna.	Van Dyke, PA	CB	0	0	0	0	2	3	0	0	Failed journal on 55th car derailed train fouling adjacent track which derailed passing train - units considerably damaged	3945
180	2-10-62	NY Cent.	Ligonier, IN	CB	0	0	0	0	2	1	0	0	Broken wheel on 119th car caused derailment in front of passing train on adjacent track - units considerably damaged	3943
181	1-16-62	Mo.Pac.	Desoto, MO	CB	0	0	0	0	2	0	0	0	Passing train struck derailed car fouling main track - units turned over	3937
182	9-24-61	St.L&S.F.	Bay, AR		0	0	0	0	1	2	0	0	Failed journal derailed train striking another train standing on siding - unit turned over, badly damaged	3927
183	8-2-61	Fla.East Coast	Boynton Beach, FL	CB	0	0	0	0	2	2	0	0	Overtaking train struck side of units of train on cross over switch - units somewhat damaged	3924

TRAIN ACCIDENTS

Exhibit E-1

Derailments

RS = Road Switcher Type Units
CB = Car Body Type Units
SW = Switcher Units

Case No.	Date	Railroad	Location	Type of Units	Location Killed			Location Injured			Remarks/Cause	Document Source
					Closing Speed	Loco	Ground	Loco	Ground	Ground		
184	4-22-71	SP	Truckee, CA	RS	Excessive	1	0	0	0	0	Engineer incapacitated - units destroyed	4179
185	4-28-70	L&N	Jimhill, KY	RS	20	0	0	0	0	0	Rockslide - units badly damaged	RR
186	3-16-70	Mo.Ill	Flinton, IL	?	15	0	0	0	0	0	Bridge collapse - units badly damaged	FRA
187	3-13-70	B. & O.	Carrcraft, DE	?	50	0	0	0	0	2	Open switch-false proceed, malicious tampering	FRA
188	1-26-70	BN	Charlen Falls, WA		23	0	0	0	0	0	Rockslide - units badly damaged	RR
189	1-25-70	BN	Maryhill, WA	RS	23	0	0	0	0	0	Rockslide - units badly damaged	RR
190	1-14-70	Cal. West	Summit, CA	SW	55	0	0	0	0	1	Excessive speed on curve - units badly damaged	FRA
191	11-11-69	L&N	Etheridge, TN	RS	25	0	0	0	0	0	Engineer & brakeman injured when 2nd car behind engine derailed	RR
192	12-16-68	BN	Wilmet, IL	?	20	0	0	0	0	3	Malicious tampering with switch - units considerably damaged, derailed	
193	9-23-68	PC	Ashtabula, OH	RS	61	0	0	0	0	3	Improper air brake test - excessive speed on 15 mph curve - units heavily damaged	4167
194	5-18-68	L&N	Lafollete, TN	RS	45	0	0	0	0	1	Broken rail - unit badly damaged	RR
195	8-23-67	SOU	Lockhart, SC	SW	0	1	0	0	0	0	Track fill washed out switch loco dropped into washout 10 ft. deep	4133
196	3-15-67	C&O	Fire Creek, WV	CB	47	0	0	0	0	2	Train struck landslide - units heavily damaged	4117
197	10-11-66	INT	Arno, VA	RS	38	0	0	0	0	1	Failure to have sufficient air brakes - excessive speed - unit badly damaged	4104
198	8-26-66	SP	Monte Vista, CA	RS	58+	0	1	0	0	0	Improper air brake test - over turned	4102
199	6-6-66	MILW	Templeton, IO	CB	79	0	0	0	0	2	Failure to control train per signal - units considerably damaged	4087
200	5-23-66	MILW	Sixteen, MT	CB	62	0	0	0	0	0	Failure to control train speed - units heavily damaged	4091
201	4-11-66	NH	West Roxbury, MA		48	0	0	0	0	3	Malicious tampering with switch - units turned over, considerably damaged	4084
202	3-16-66	SP	Tehachapi, CA	RS	Excessive	2	0	0	0	1	Failure to control train speed - units destroyed, probably over 85 mph on 30 mph curve	4088
203	2-24-66	MP	Benton, AR	RS	71	1	0	0	0	1	Failure to control train per signal - units considerably damaged	4085
204	1-10-66	B&O	Bond, MD	RS	56	1	0	0	0	0	Failure to control train speed - units heavily damaged	4073

RS = Road Switcher Type Units
 CB = Car Body Type Units
 SW = Switcher Units

Case No.	Date	Railroad	Location	Type of Units	Location Killed				Location Injured				Remarks/Cause	Document Source
					Closing Speed	Engine	caboose	Ground	cab	caboose	Engine	Ground		
205	6-13-65	B&M	Shawsheen, MA	RS	33	1	0	0	1	1	0	0	Train struck dirt washout slide - units badly damaged	4045
206	2-23-65	SOU	Toinette, AL	RS	30	0	0	0	2	1	0	0	Failure to line switch - lead unit overturned - badly damaged	4041
207	5-18-64	P&WY	Monessen, PA	CB	40	1	0	0	1	1	0	0	Train struck rockslide - failure to control train per signal - unit heavily damaged	4012
208	4-5-64	SF	Doublea, AZ	CB	81	2	1	0	0	1	0	0	Passenger train struck rockslide - 5 units destroyed	4007
209	7-2-63	NS	Eagle Road, NC	RS	32	1	2	0	1	0	0	0	Collapse of trestle damaged by fire - unit destroyed	4000
210	3-11-63	C&O	Winwright, KY	RS	32	1	0	0	1	2	0	0	Washout - units heavily damaged	3989
211	1-7-63	C&O	Ramage, WV	RS	31	0	0	0	2	2	0	0	Poor track on curve - units considerably damaged	3982
212	9-1-62	PA	Greenwood, IN	CB	41	1	0	0	1	2	0	0	Malicious tampering with switch - units overturned - badly damaged	3964
213	7-4-62	ACL	Effingham, SC	CB	55	2	0	0	0	3	0	0	Train derailed at temporary cross over at excessive speed - unit turned over & cab filled with mud to 6 ft.	3955
214	6-10-62	NP	Evandro, MT	CB	87 out of control	0	0	0	2	3	0	0	Failure to control train speed - units destroyed and heavily damaged	EXP 229 3946A
215	3-28-62	MILW	Suton, IO	CB	25	1	0	0	1	1	0	0	Washout - units turned over - heavily damaged	3946
216	1-31-62	MP	Myersville, AR	CB	47	0	0	0	1	2	0	0	Struck roadkslide - units heavily damaged	3940
217	1-9-62	IC	Alta, IO	RS	58	1	0	0	1	3	0	0	Snow packed at road crossing - lead diesel turned outside - heavily damaged	3942
218	11-21-61	NYC	Poca, WV	CB	42	2	0	0	0	0	0	0	Failure to control train speed over bridge - 3rd and 4th units derailed & dropped into river with fireman & brakeman	3933
219	6-18-61	C of GA	Macon, GA		45	0	0	0	1	0	0	0	Improper MU connections - train out of control	3918
220	4-8-61	SAL	Raleigh, NC	CB	40 Excessive	0	0	0	?	0	0	0	Failure to control train speed - units overturned	3911
221	2-5-61	PA	Black, MD	RS	8	1	0	0	1	0	0	0	Frozen earth obstruction derailed snow plow struck cab of diesel unit pusher	3909
222	2-2-61	PA	Bowie, MD	CB	55 Excessive	0	0	0	?	4	0	0	Failure to control train speed - train entered turnout to branch line at excessive speed - unit over turned - badly damaged	EXP 225 3905 A

TRAIN ACCIDENTS

Exhibit F-1

Train - Truck Collisions at Highway Crossings

RS = Road Switcher Type Units
CB = Car Body Type Units
SW = Switcher Units

Case No.	Date	Railroad	Location	Type of Units	Train Speed	Truck Speed	Location Killed			Location Injured			Remarks	Document Source
							caboose	ground	cab	caboose	cab	ground		
223	6-15-72	SOU	Isbell, AL	RS	12	60	0	0	0	0	0	0	Train struck by truck	RR
224	5-17-72	Sou.Pac.	Sacramento Div.	RS	30	?	0	0	0	0	0	0	Truck failed to clear crossing	RR
225	4-26-72	SOU	Germantown, TN	RS	30	?	0	0	0	0	0	0	Truck failed to clear crossing	RR
226	11-9-71	SOU	Russellville, AL	RS	31	?	0	0	0	0	0	0	Truck failed to clear crossing	RR
227	10-23-71	SOU	Russellville, AL	RS	40	20	1	0	0	0	0	0	Train struck loaded gravel truck	RR
228	7-22-71	Burl-Nor.	Woodland, WA	RS	30	?	0	0	0	0	2	0	Train struck caterpillar earth-mover	RR
229	10-16-70	SOU	Mobile, AL	SW	2	?	0	0	0	0	1	0	Truck slip into side of engine	RR
230	9-19-70	St.L. S.W.	Grapevine, TX	RS	20	-	3	0	0	0	0	0	Truck failed to clear crossing-gasoline truck	FRA
231	7-6-70	Balt&Ohio	West Dana, IL	RS	30	-	1	0	0	0	2	0	Truck failed to clear crossing	FRA
232	7-3-70	SOU	Gainesville, GA	RS	50	10	0	0	0	0	2	0	Truck failed to clear crossing	RR
233	4-23-70	Burl-Nor.	Ferndale, WA	RS	30	?	0	0	0	0	2	0	Truck failed to clear crossing	RR
234	1-24-70	Ill Cent.	Loda, IL	CB	79	-	0	0	3	0	0	0	Truck failed to clear crossing-gasoline truck	FRA
235	9-12-69	Burl-Nor.	---	RS	45	28	0	0	0	0	1	0	Truck failed to clear crossing	RR
236	8-15-69	Louis&Nash	Cumberland City, TN	RS	38	48	0	0	0	0	2	0	Train struck loaded cement truck	RR
237	6-13-69	Burl-Nor.	Barr, CO	RS	30	8	0	0	0	0	1	0	Train struck truck loaded with hot asphalt	RR
238	3-3-69	Tex&Pac	Ama, LA	SW	43	4	0	0	2	0	0	0	Train struck gasoline truck, crew set afire in cab, then jumped	4161
239	9-16-68	Burl-Nor	Hebron, NB	RS	18	35	0	0	0	0	1	0	Truck failed to clear crossing	RR
240	9-5-68	Burl-Nor	Pleasantville, IO	RS	25	15	0	0	0	0	2	0	Truck failed to clear crossing	RR
241	7-17-68	Nor&West	Abingdon, VA	RS	42	3	1	0	0	0	0	2	Train struck truck loaded with gasoline - fire	4147
242	12-27-67	Tex&Pac	Tye, TX	RS	55	33	0	0	0	0	4	0	Truck failed to clear crossing	4140
243	10-10-67	Louis&Nash	Luellen, KY	RS	23	?	0	0	0	0	0	0	Truck failed to clear crossing	RR
244	9-23-67	Sou.Pac.	Bassett, CA	CB	55	7	0	0	0	0	2	0	Truck failed to clear crossing	4131
245	8-30-67	C.R.I&P.	Henry, IL	CB	79	15	0	0	0	0	2	1	Truck failed to clear crossing	4132
246	2-27-67	G.M.&O.	Willow Springs, IL	CB	30	0	0	0	0	0	2	0	Truck failed to clear crossing	4111
247	2-21-67	Louis&Nash	Nashville, TN	RS	20	?	0	0	0	0	1	0	Road building machine failed to clear crossing	RR
248	12-28-66	Post&Maine	Everett, MA	RDC	60+	?	2	0	0	0	0	0	Struck gasoline truck - fire	4107A
249	10-15-66	C.B.&Q.	Island Brook, IO	CB	72	40	0	0	0	0	2	0	Truck failed to clear crossing	4119
250	8-27-66	Sou.Pac.	Clotho, CA	RS	45	43	0	0	0	0	3	1	Truck failed to clear crossing - locomotive turned over	4096
251	6-28-66	Ill.Cent.	Carol Stream, IL	RS	70	5	0	0	0	0	2	0	Truck failed to clear crossing - units derailed	4089
252	3-9-66	C.R.I&P.	Logan, NM	RS	48	0	0	0	0	0	3	0	Truck failed to clear crossing - 1st four units destroyed	4080
253	2-28-66	Atl.C.Line	Branford, FL	RS	43	28	1	0	0	0	1	0	Truck failed to clear crossing - some of log cargo entered cab	4074
254	12-22-65	A.T.&S.F.	Anaheim, CA	CB	68	40	0	0	0	0	2	0	Truck with 14 tons dirt failed to clear crossing	4066

Exhibit F-2

RS = Road Switcher Type Units
 CB = Car Body Type Units
 SW = Switcher Units

Case No.	Date	Railroad	Location	Type of Units	Location Killed			Location Injured			Remarks	Document Source
					Train Speed	Truck Speed	Ground	Car	Switcher	Ground		
255	12-11-65	Seaboard A.L.	Catawba, SC	RS	55	0	1	0	0	0	Truck loaded with crushed rock failed to clear crossing	4067
256	11-23-65	NY Cent.	Galien, MI	CB	81	15	0	0	1	0	Truck load of gravel failed to clear crossing	4063
257	11-20-65	Union Pac.	Rolla, CO	CB	79	slow	2	0	0	0	Train struck gasoline truck - fire	4065
258	9-14-65	Balt&Ohio	Roby, IL	RS	38	undet	1	0	0	0	Truck load of limestone struck diesel	4060
259	8-24-65	Car&No.W.	Leaksville, NC	RS	7	6	1	0	0	2	Train struck gasoline truck - fire	4059
260	7-1-65	Ill.Cent.	Como, MS	RS	35	0	5	0	0	0	Train struck gasoline truck - fire	4055
261	3-14-65	Tex&Pac.	Grand Saline, TX	CB	65	slow	2	0	0	0	Train struck truck loaded with crude oil - fire	4046
262	2-2-65	T.P.&W.	Chenoa, IL	RS	44	43	0	0	2	0	Truck failed to clear crossing	4037
263	9-14-64	G.C&S.F.	Clifton, TX	CB	50	slow	2	0	0	0	Train struck gasoline truck - fire	4022
264	9-9-64	Wabash	Marshfield, IN	CB	72	slow	0	0	0	0	Train struck truck loaded with cement blocks	4023
265	1-23-64	Sou.Pac.	Watson, CA	RS	18	20	1	3	0	1	Train struck gasoline truck - fire	4004
266	6-26-63	Union Pac.	Egbert, WY	CB	51	slow	1	0	0	1	Crane with boom extended fouled main track	3997
267	4-18-63	Gr.Tr.West	Charlotte, MI	RS	78	slow	1	0	1	2	Truck load of structural steel beams failed to clear crossing	3993
268	2-15-63	Ches&Ohio	Michigan City, IN	CB	69	43	0	0	2	0	Truck failed to clear crossing	3986
269	1-17-63	Del&Hud	Moosic, PA	RS	35	slow	0	0	3	0	Truck loaded with 12-15 tons rock failed to clear crossing	3983
270	12-20-62	Seabd A.L.	Okeechobee, FL	CB	75	10	1	0	2	1	Truck loaded with oranges failed to clear crossing	3956-C
271	11-23-62	St.I&S.W.	Chandler, TX	CB	55	8	2	0	0	0	Train struck truck loaded with crude oil - fire & explosion	3956-B
272	11-8-62	SOU	Eastaboga, AL	CB	60	2	1	0	1	0	Train struck truck loaded with gasoline - fire	3956-A
273	4-19-62	Ches&Ohio	La Porte, IN	RS	37	28	2	0	1	0	Train struck truck loaded with propane - fire & explosion	3942-A
274	11-16-61	C.R.I&P.	Beech, IO	CB	79	4	0	0	2	0	Train struck grader on crossing	3931
275	11-6-61	Miss.Pac.	Westfield, TX	CB	77	43	0	0	0	1	Truck loaded with brick struck 3rd diesel of train	3932
276	10-25-61	Milw.	Miles City, MT	RS	65	15	0	0	1	1	Truck loaded with gravel failed to clear crossing	3929
277	8-24-61	Wabash	Hand, MI	CB	70	?	1	0	1	0	Train struck truck loaded with gasoline - fire	3926

Exhibit F-3

RS = Road Switcher Type Units
CB = Car Body Type Units
SW = Switcher Units

Case No.	Date	Railroad	Location	Type of Units	Location Killed				Location Injured				Remarks	Document Source
					Truck Speed	Train Speed	Truck Speed	Ground	Car	Caroose	Ground	Remarks		
278	6-21-61	D.R.I&N.W.	Bettendorf, IO	RS	15	13	1	0	2	0	0	0	Train struck truck loaded with gasoline - fire	3919
279	6-17-61	Miss.Pac.	Bigwells, TX	CB	6	25	0	0	0	0	0	2	Train struck truck loaded with crude oil - fire	3916
280	6-7-61	St.L&S.W.	Bakersville, MO	RS	55	28	0	0	0	0	0	0	Train struck truck on crossing	3918
281	4-10-61	C&E.I.	Atherton, IN	CB	?	74	0	0	0	0	0	0	Train struck truck loaded with liquid fertilizer	3912
282	1-17-61	Ill.Cent.	Magnolia, MS	CB	15	73	1	0	1	0	0	0	Train struck truck loaded with gasoline - fire	3904-A

60 Cases

35 3 12 71 11 7

GRAND TOTAL 282 Cases, Exhibits B, C, D, E & F 176 29 24 404 190 79

TOTAL FATALITIES = 229

TOTAL INJURED = 673

STATISTICAL SUMMARY FROM FRA ACCIDENT BULLETINS NOS. 130-139

SELECTED DATA FROM TRAIN SERVICE ACCIDENTS

Code No.	Selected Causes	1961	1962	1963	1964	1965	1966	1967	1968	1969	1970
		killed	killed	killed	killed	killed	killed	killed	killed	killed	killed
		injured	injured	injured	injured	injured	injured	injured	injured	injured	injured
5103	Burn from hot oil, steam or hot water	0	9	0	6	0	0	18	1	10	0
5104	Operating steam generator or appurtenance	0	3	0	1	0	0	0	0	1	0
5105	Electrical flash, shock or burn	0	24	0	7	0	22	0	0	0	3
5106	Fumes from Int.comb. engine or appurtenance	0	19	0	25	0	15	0	0	20	15
5107	Coming in contact with objects on loco, defective equipment	0	0	0	5	0	4	0	0	11	11
5108	(same as above), other causes	0	37	0	42	0	39	0	3	1	1
5109	Struck by tools or other objects falling	0	16	0	10	0	4	0	0	23	21
5111	Stumbling, slipping or falling, due to oil leaks	0	13	0	16	0	2	0	0	9	0
5112	(same as above) due to other def. equip	0	6	0	12	0	17	0	0	0	6
5113	(same as above) due to other causes	0	108	2	86	0	19	0	12	4	17
5116	Unexpected movement of locomotive, not otherwise classified	0	98	0	126	0	151	0	59	62	77
5117	Doors, injured by	0	51	0	54	0	43	0	35	25	150
5188	Other accidents while operating locos, other causes	0	117	1	107	3	132	0	90	86	103
TOTAL, All Causes, No. 5101 - 5188		0	553	3	588	4	596	0	1	460	1
											503

TRAIN SERVICE ACCIDENTS, WHILE GETTING ON OR OFF LOCOMOTIVES OR CARS

5503	Step, stirrup or footboard, missing	0	294	0	251	1	338	1	373	1	343	1	309	1	293	0	292	2	295
5504	footing or slipping on	0	23	0	24	0	28	0	25	0	22	0	18	0	19	0	23	0	24
5505	(same as above), defective	0	143	0	158	0	149	0	166	1	175	0	168	0	128	0	122	0	122
5506	Ladder, missing foothold or slipping on	0	13	0	7	0	8	0	11	0	10	0	9	0	9	0	8	0	7
5507	Ladder, defective	0	110	0	130	0	129	0	138	1	119	0	131	0	143	0	119	0	93
	Striking hands, arms, feet, legs, head or body against cars or loco.																		
5538	Jumping from equipment in anticipation of an accident	0	135	0	113	2	123	0	147	0	118	1	103	0	118	1	121	0	140
5588	Getting on and off, not otherwise provided for	0	90	1	132	0	80	1	116	1	94	1	83	0	75	3	76	2	103
TOTAL, All Causes, No. 5501 - 5588		5	2985	5	2823	8	3001	6	3109	12	3023	6	2897	12	2941	7	2813	7	2675

TRAIN ACCIDENTSINJURIES FROM HARD COUPLINGS, ROUGH TRACK AND SLACK ACTION

Case No.	Date	Railroad	Remarks
	<u>HARD COUPLINGS</u>		
1.	6-22-72	B.N.	Engineer thrown forward, cut face.
2.	6-11-62	B.N.	Engineer thrown from seat.
3.	5-15-72	B.N.	Engineer fractured cheek bone against window.
4.	4-26-72	SOU.	Engineer's head struck control panel (7 mph).
5.	4-16-72	SOU.	Brakeman fell against water cooler (5 mph).
6.	4-4-72	S.P.	Engineer injured back.
7.	2-25-72	S.P.	Brakeman thrown against radio.
8.	2-12-72	B.N.	Engineer fell from Seat, cut over eye on window.
9.	1-19-72	S.P.	Brakeman thrown off seat against radio.
10.	1-14-72	S.P.	Engineer injured against control panel.
11.	12-15-71	SOU.	Cut of cars struck engine (5 mph), engineer fell against wall; conductor knocked down in cab.
12.	12-10-71	L. & N.	Engineer struck face against window frame.
13.	12-3-71	B.N.	Engineer knocked off seat, car ran against engine (12 mph)
14.	10-12-71	SOU.	Switchman fell against cooler (4 mph)
15.	10-8-71	B.N.	Engineer injured back.
16.	7-23-71	B.N.	Engineer knocked from seat.
17.	6-7-71	B.N.	Engineer injured back, jolted from seat.
18.	6-3-71	B.N.	Engineer injured elbow on control stand.
19.	6-2-71	SOU.	Engineer injured neck (3 mph).
20.	5-30-71	SOU.	Brakeman struck head on cab door.
21.	5-1-71	B.N.	Engineer injured, jarred off seat.
22.	4-29-71	SOU.	Brakeman jumped before engine struck cars (12 mph); fractured leg.

<u>Case No.</u>	<u>Date</u>	<u>Railroad</u>	<u>Remarks</u>
23.	4-15-71	B.N.	Engineer knocked down when shoved cars into standing cut of cars at 8 mph.
24.	1-20-71	SOU.	Unexpected coupling (10 mph), engineer brushed forehead against window.
25.	1-8-71	B.N.	Hostler sustained whiplash injury.
26.	1-4-71	B.N.	Engineer jarred off seat, injured.
27.	12-12-70	B.N.	Engineer struck head on window when 2 cuts of cars were shoved together (10 mph).
28.	12-18-70	B.N.	Engineer sustained back injury.
29.	11-18-70	B.N.	Engineer injured when forced into back rest of seat.
30.	9-22-70	B.N.	Engineer sustained strained back.
31.	9-14-70	B.N.	Switchman sustained injury when thrown into seat.
32.	9-9-70	B.N.	Engineer sustained strained back.
33.	9-5-70	SOU.	Trainman jumped from Engine at 20 mph, thinking collision with cut of cars was occurring, fractured ankle.
34.	7-16-70	SOU.	Coupling at 6 mph threw switchman off step.
35.	5-12-70	B.N.	Engineer injured when engine struck by car off hump (9 mph).
36.	4-7-70	SOU.	Engineer thrown against window (6 mph).
37.	3-4-70	SOU.	Engineer rising from seat, fell into mirror and strained back (5 mph).
38.	2-14-70	SOU.	Employee knocked off engine deck, fractured leg and pelvis (10-12 mph).
39.	2-14-70	L. & N.	Engineer struck head against window frame.
40.	1-16-70	SOU.	Fearing hard coupling, conductor jumped off engine at 10 mph, sustaining back injury.
41.	7-6-69	B.N.	Engineer injured hand against control stand.
42.	4-23-69	B.N.	Switchman injured against seat edge.

<u>Case No.</u>	<u>Date</u>	<u>Railroad</u>	<u>Remarks</u>
43.	4-1-69	B.N.	Engineer injured back.
44.	12-6-68	B.N.	Engineer injured lip against window.
45.	9-10-68	B.N.	Engineer and yardman injured.
46.	8-22-68	B.N.	Switchman fell from cab door against hard rail.
47.	7-6-68	B.N.	Engineer knocked down when shoved cars against standing cars at 8 mph.
48.	3-29-68	L. & N.	Engineer sustained strained back.
49.	3-10-68	L. & N.	Engineer sustained back injury.
50.	1-1-68	B.N.	Engineer injured when knocked off seat.
51.	6-8-66	L. & N.	Engineer sustained back injury.
52.	4-21-66	L. & N.	Engineer sustained back sprain.
53.	4-20-66	L. & N.	Engineer sustained back injury.

53 Cases -- 55 Injuries

ROUGH TRACK

54.	10-14-71	SOU.	Engineer rising from seat, fell into throttle stand when engine swayed.
55.	7-15-71	L. & N.	Brakeman injured elbow on window ledge as engine swayed.
56.	6-19-71	SOU.	Fireman struck head on column going over Clinch River bridge.
57.	5-15-71	SOU.	Conductor bruised back against back of seat when low place in track cause fall against seat.
58.	6-23-70	SOU.	Fireman standing, fell against cab door when engine rocked.
59.	9-20-68	B.N.	Engineer reached for brake, injured hand when engine rocked.

<u>Case No.</u>	<u>Date</u>	<u>Railroad</u>	<u>Remarks</u>
60.	5-6-66	PENNA.	Engineer injured on protruding arm rest hinge when engine lurched.

6 Cases -- 6 Injuries

SLACK ACTION

61.	8-30-71	L. & N.	Switchman knocked against front of engine cab.
62.	5-8-71	SOU.	Conductor fell against radio stand.
63.	10-2-70	SOU	Conductor fell against side of engine cab.
64.	7-7-70	SOU.	Trainman fell against report holder in cab.
65.	1-30-70	SOU.	Conductor fell from seat in engine.

5 Cases -- 5 Injuries

TOTAL 65 Cases -- 67 Injuries

CAB ENVIRONMENT INVOLVING INJURYINJURIES FROM CAB DOORS AND LATCHES

<u>Case</u> <u>No.</u>	<u>Date</u>	<u>Railroad</u>	<u>Remarks</u>
<u>FROM FRA RECORDS</u>			
1.	10-8-71	P.C.	Employee injured account top and middle hinge of cab door broken.
2.	9-3-71	L. & N.	Door closed on employee's hand - lost first joint of finger.
3.	4-28-70	P.C.	Engineer injured hand in defective door.
4.	4-19-70	T. & P.	Switchman injured elbow account defective door latch.
5.	4-1-70	L.I.	Trainman injured back when fell due to defective door latch.
6.	12-21-66	PENNA.	Employee injured account door failed to close securely due to improperly adjusted lock keeper.
7.	6-15-66	N.Y.C.	Employee injured wrist account rotary motion of latch handle restricted accumulated dirt and rust.
8.	12-19-65	N.Y.C.	Employee injured account door latch handle and assembly separated from door.
9.	11-28-65	I.C.	Employee injured account defective door latch prevented opening of door.
10.	10-13-65	N.Y.C.	Employee injured account door latch handle and assembly separated from door.
11.	8-25-65	N.Y.C.	Employee injured account defective door latch due to latch assembly missing.
12.	5-8-65	B. & M.	Employee injured account undesired trap door opening due to defective latch apring.
13.	12-5-64	E.L.	Employee crushed finger closing nose door-defective hinge and latch.
14.	11-22-64	N.Y.C.	Employee fell to ground when cab door lock body failed.
15.	7-4-62	T. & P.	Employee injured hand due to defective spring latch on cab door to nose compartment.

<u>Case No.</u>	<u>Date</u>	<u>Railroad</u>	<u>Remarks</u>
16.	4-7-62	E.L.	Employee injured when door latch handle came loose from door.
17.	10-13-61	M.K.T.	Employee injured account insufficient clearance around door latch handle.
18.	8-23-61	S.P.	Employee injured account cab door latch imoperative.
19.	8-7-61	M.K.T.	Employee injured tripping over stick holding door open due to door opening catch missing.
20.	7-30-61	C.R.I. & P.	Employee injured opening cab door that was stuck due to defective door latch assembly.
21.	7-24-61	N.Y.C.	Employee injured when cab door latch handle separated from door.
22.	10-27-60	S.P.	Employee injured when cab door opened unexpectedly due to improper cab door latch handle.
23.	10-19-60	St.L. & S.F.	Employee injured when cab door would not remain closed due to broken latch.

FROM RAILROAD FILES

24.	6-9-72	L. & N.	Wind blew door closed on employee's hand.
25.	5-28-72	L. & N.	Suction from cooling fans pulled cab to engine room door closed on employee's hand.
26.	3-13-70	L. & N.	Cab door was closed on employee's hand.
27.	10-10-69	L. & N.	Employee had hand caught in door frame when another employee closed door.
28.	5-28-67	L. & N.	Cab door was closed on employee's hand.
29.	6-15-72	B.N.	Electric cabinet door in cab came loose, fracturing employee's finger.
30.	1-25-72	B.N.	Cab door was closed on employee's hand.
31.	6-6-71	B.N.	Wind blew door shut on employee's hand.
32.	5-5-71	B.N.	Cab door was closed on employee's hand.

<u>Case No.</u>	<u>Date</u>	<u>Railroad</u>	<u>Remarks</u>
33.	5-1-71	B.N.	Cab door was closed on employee's hand.
34.	4-21-71	B.N.	Employee injured account nose door hard to open.
35.	3-2-71	B.N.	Cab door opened suddenly striking employee's head against louvers.
36.	1-2-71	B.N.	While closing cab door employee fell to ground.
37.	11-7-70	B.N.	Employee caught finger in door being closed.
38.	9-25-70	B.N.	Employee departing from cab, closed door on his finger.
39.	7-25-70	B.N.	Cab door was closed on employee's hand.
40.	6-16-70	B.N.	(same as above)
41.	4-2-70	B.N.	cab door was closed on employee's hand, severing end of finger.
42.	12-6-68	C.B.& Q.	Employee closed nose door on foot.
43.	9-25-68	C.B.& Q.	Wind blew cab door closed on employee's hand.
44.	3-27-68	C.B.& Q.	Employee caught hand in cab door he was closing.
45.	7-5-72	SOU.	Wind blew cab door closed on employee's finger.
46.	7-2-72	SOU.	Employee sustained injured finger when cab door was closed.
47.	7-2-72	SOU.	Employee injured when stuck door opened suddenly.
48.	4-27-72	SOU.	Employee had fingers injured when door was closed by motion of unit.
49.	4-9-72	SOU.	Employee closed door on another employee's hand.
50.	2-20-72	SOU.	Employee closed door on own hand.
51.	2-17-72	SOU.	Employee caught hand between cab door and engine hood.
52.	2-17-72	SOU.	Cab door was closed on employee's hand.

<u>Case No.</u>	<u>Date</u>	<u>Railroad</u>	<u>Remarks</u>
53.	2-3-72	SOU.	Cab door was closed on employee's hand.
54.	12-24-71	SOU.	Cab door fell off on employee's foot when being opened.
55.	12-8-71	SOU.	Cab door hung on outside latch - when pulled, it closed suddenly on employee's hand.
56.	12-6-71	SOU.	Wind blew cab door closed on employee's hand.
57.	10-21-71	SOU.	Cab door closed behind employee entering cab striking a following employee in mouth.
58.	10-10-71	SOU.	Employee closed door on own hand.
59.	10-7-71	SOU.	Employee entering cab was struck in mouth by latch handle as door opened.
60.	9-17-71	SOU.	Cab door swung open injuring employee.
61.	9-4-71	SOU.	Employee turning latch handle, cut finger on protruding screw.
62.	8-11-71	SOU.	Cab door slammed closed on employee's hand.
63.	7-9-71	SOU.	Cab door was closed in employee's hand.
64.	7-5-71	SOU.	(same as above)
65.	6-19-71	SOU.	Cab door was closed on employee's finger.
66.	6-13-71	SOU.	(same as above)
67.	6-2-71	SOU.	Glass in door shattered when slammed closed, injuring employee's eye.
68.	5-14-71	SOU.	Cab door was closed on employee's hand.
69.	2-3-71	SOU.	Employee closed door on own hand, amputating finger.
70.	1-6-71	SOU.	Employee closed door on own hand.
71.	1-5-71	SOU.	Employee closed door on own hand, amputating 1st joint of ring finger.
72.	12-24-70	SOU.	Employee closed door on own finger.
73.	11-12-70	SOU.	Employee closed door on own hand.

<u>Case No.</u>	<u>Date</u>	<u>Railroad</u>	<u>Remarks.</u>
74.	11-4-70	SOU.	Employee closed door on own hand.
75.	10-23-70	SOU.	(same as above)
76.	10-19-70	SOU.	Employee following another through door, had door strike him in head.
77.	10-12-70	SOU.	Motion of unit closed door on employee's fingers.
78.	10-11-70	SOU.	Door from cab to enginer room closed on employee's fingers.
79.	10-2-70	SOU.	Cab door swung back and closed on employee's fingers.
80.	9-30-70	SOU.	Employee closed door on own hand.
81.	7-12-70	SOU.	Employee closed door on own finger.
82.	7-9-70	SOU.	Cab door was closed on employee's hand.
83.	6-25-70	SOU.	Employee injured elbow on cab door.
84.	6-24-70	SOU.	Employee closed door on own finger.
85.	6-14-70	SOU.	Wind blew cab door closed on employee's hand.
86.	6-12-70	SOU.	Employee closed door on own fingers.
87.	6-3-70	SOU.	cab door slammed shut on employee's hand when unit was stopped.
88.	5-12-70	SOU.	Employee struck knee on door facing.
89.	4-14-70	SOU.	Employee following another through door, door swung back closed on finger.
90.	3-30-70	SOU.	Employee fell when cab door that was hard to open, opened suddenly.
91.	6-30-72	S.P.	Employee bruised thumb reaching for door latch handle.
92.	3-10-72	S.P.	Employee sprained wrist trying to open jammed door.
93.	3-1-72	S.P.	Wind slammed door closed on employee's fingers.
94.	2-28-72	S.P.	Employee closed door on own hand.

<u>Case No.</u>	<u>Date</u>	<u>Railroad</u>	<u>Remarks</u>
95.	11-12-71	S.P.	Employee closed door on own finger.
96.	7-21-71	S.P.	Cab door was swung closed on employee's finger by braking action.
97.	11-14-70	S.P.	Employee pulled door shut on own finger.
98.	8-3-70	S.P.	Employee closed cab door on own finger.
99.	6-20-68	S.P.	Employee had finger caught in door when closed.
100.	6-4-68	S.P.	Employee had finger injured when engine room pressure caused door to fly open into cab.
101.	6-7-68	S.P.	Cab door was closed on employee's thumb when wind caught it.
102.	5-15-68	S.P.	Cab door blew open due to defective latch; when wind caught door and closed it again, door closed on employee's finger.
103.	5-4-68	S.P.	Cab door was closed on employee's thumb.
104.	4-17-68	S.P.	Employee closed door on own finger.
105.	3-20-68	S.P.	Employee closed door on own hand.
106.	1-17-68	S.P.	Wind caught cab door slamming it closed on employee; jamming elbow.
107.	12-10-67	S.P.	Employee closed door to steam generator compartment on own thumb.
108.	12-13-67	S.P.	Employee closed engine room to cab door on own finger.
109.	11-17-67	S.P.	Cab door was closed on employee's fingers.
110.	11-5-67	S.P.	Employee closed door to steam generator compartment on own finger.
111.	2-26-68	S.P.	Employee closed door on thumb.
112.	10-2-67	S.P.	Employee closed door on hand.
113.	9-17-67	S.P.	Employee closed door on hand.
114.	9-2-67	S.P.	Employee closed door by catch closing door on hand.

<u>Case No.</u>	<u>Date</u>	<u>Railroad</u>	<u>Remarks</u>
115.	8-21-67	S.P.	Employee slammed door on own finger.
116.	7-29-67	S.P.	Employee's finger caught on door latch and smashed against safety latch.
117.	5-28-67	S.P.	Employee caught finger in hinged edge of door.
118.	5-26-67	S.P.	Employee caught finger between cab door and door frame.
119.	4-23-67	S.P.	Employee closed cab door on another employee's finger.
120.	4-22-67	S.P.	Cab door closed on employee's hand.
121.	3-9-67	S.P.	Wind blew cab door closed on employee's hand.
122.	4-7-67	S.P.	Cab door was closed on employee's hand when coupling was made.
123.	4-3-67	S.P.	Employee closed door on finger.
124.	2-6-67	S.P.	Cab door opened suddenly striking employee on elbow.
125.	1-28-67	S.P.	Cab door closed on employee's finger.
126.	1-19-67	S.P.	Employee caught finger between latch and door when closing door.
127.	1-16-67	S.P.	Employee closed door without using latch handle, catching finger between door and frame, amputating same at first joint.
128.	1-15-67	S.P.	Employee closed nose door on foot.
129.	6-25-66	S.P.	Employee closed door on hand at hinged edge of door frame.
130.	6-18-66	S.P.	Cab door closed on employee's hand.
131.	5-25-66	S.P.	Employee closed cab door on hand.
132.	5-15-66	S.P.	Employee closed cab door on hand when hand slipped off latch handle.
133.	12-1-64	S.P.	Cab door slammed closed on employee's hand.
134.	10-22-64	S.P.	Cab door closed on employee's hand.

<u>Case No.</u>	<u>Date</u>	<u>Railroad</u>	<u>Remarks</u>
135.	9-22-64	S.P.	Cab door closed on employee's fingers.
136.	7-23-64	S.P.	Cab door closed on employee's fingers.
137.	7-8-64	S.P.	Cab door slammed on employee's fingers.
138.	1964	S.P.	Eleven more cases indicated as having occurred in 1964 - with no further details given.
139.			
140.			
141.			
142.			
143.			
144.			
145.			
146.			
147.			
148.			

148 Cases -- 148 Injuries

CAB ENVIRONMENT INVOLVING INJURYINJURIES FROMCAB SEATS, ARM AND BACK RESTS

<u>Case No.</u>	<u>Date</u>	<u>Railroad</u>	<u>Remarks</u>
FROM FRA FILES			
1	1-20-72	C. & N.W.	Seat was set up on last notch where it could not be locked by pin. When slack ran out, seat came out of pedestal and engineer fell with seat.
2	12-26-71	P - C	Fireman's seat turned over with occupant - account Bolt missing that retains cylindrical spring loaded male pedestal inside the support column.
3	11-19-71	B & M	Seat cushion frame separated from locking lug account defective weld.
4	11-11-71	P - C	Cab seat back rest adjusting pin broke allowing back rest to drop backward.
5	9-15-71	B & O	When undesired emergency occurred, cab seat pulled out of place and engineer fell backward with seat. Had been inadequately secured by 6 screws, 3 of which pulled out and 3 partly sheared.
6	6-2-71	P - C	Center cab seat not securely fastened to floor, Instead of 6 - $\frac{1}{2}$ " bolts, $\frac{3}{8}$ " x $1\frac{1}{2}$ " lag screws were used. Seat had been repositioned in 3 different locations. Seat fell over with occupant.
7	3-13-70	D & H	Cab seat failure injured fireman.
8	2-27-70	P - C	Cab seat failure injured engineer.
9	1-14-70	C.R.I.&P.	Cab seat failure injured switch foreman.
10	5-13-66	PA	Defective hardwood base of cab seat failed to hold back rest bracket screws and back rest fell backward.
11	1-8-66	PA	Broken hinge in seat supporting leg caused seat to collapse.
12	12-21-65	TRR St.L.	Failure of both sides of cab seat back rest caused back rest to fall with occupant

<u>Case No.</u>	<u>Date</u>	<u>Railroad</u>	<u>Remarks</u>
13	12-11-65	SOU	Failure of weld caused back rest to separate from seat frame.
14	11-7-65	B & O	Failure of cab seat back rest caused fall.
15	9-27-65	PA	Screws missing from hinged support caused seat to collapse.
16	7-25-65	NYC	Employee was thrown to floor when back rest index pin broke.
17	6-24-65	S.P.	Cab seat broke off due to failure of weld in plate that supports cushion.
18	6-23-65	B & M	Failure of weld at cab seat locking on bottom of cushion frame caused seat to fall with occupant.
19	4-9-65	B & O	Cab seat pedestal broke loose from floor.
20	3-17-65	NYC	Cab seat back rest positioning device failed, and back rest fell backward.
21	1-21-65	P & LE	Screws fastening cab seat to floor loose and missing and seat overturned.
22	12-21-64	SOU	Cab seat back rest of faulty design failed.
23	12-13-64	B & M	Failure of cab seat post due to defective weld.
24	12-11-64	NYC	Weld failure of back rest frame caused back rest to fall backward.
25	11-21-64	Gr. Nor.	Cab seat back rest failed.
26	11-4-64	Mo. Pac.	Wood screws fastening cushion to seat base pulled out allowing seat cushion and back rest to fall backward.
27	10-11-64	SOU	Cab seat pulled loose from floor and fell over.
28	9-26-64	PA	Defective seat locking device permitted undesired movement of seat at impact.
29	9-10-64	D. & R.G.W.	Cab seat failed account faulty repair of previous defective swivel pin.
30	8-13-64	PA	Defective hinge pivot securing back of cab seat to the wall allowed seat to collapse.

<u>Case No.</u>	<u>Date</u>	<u>Railroad</u>	<u>Remarks</u>
31	7-12-64	PA	Cab seat back rest came detached from back rest frame due to missing screws.
32	7-6-64	NYC	Weld failure of back rest frame caused back rest to fall backward.
33	6-16-64	Union	Defective seat elevating device became disengaged permitting seat to fall from maximum to minimum height, spring and locking pin missing.
34	6-4-64	Union	Defective seat elevating device became disengaged permitting seat to fall from maximum to minimum height, spring and locking pin missing. #33 and #34 are for the same locomotive.
35	5-19-64	PA	Defective securing seat base column to base plate and loose bolts permitted seat to tip backward.
36	3-12-64	PA	Wood screws fastening cab seat pedestal base to floor pulled out permitting seat to overturn.
37	2-17-64	PA	Wood screws fastening hinge of folding leg of seat pulled out causing seat to collapse.
38	2-3-64	B & M	Wood screws fastening cab seat cushion to seat pulled out permitting seat to overturn.
39	12-18-63	Sou.Pac.	Cab seat broke due to ineffective welding of seat cushion plate to supporting column.
40	11-30-63	Wabash	Seat not secured by locking pin, swiveled around by slack action injuring occupant.
41	11-14-63	NYC	Employee suffered injury trying to adjust an improperly assembled seat.
42	9-18-63	Mo.Kans.Tex.	Cab seat cushion and back rest attached to pedestal with wood screws became separated.
43	7-1-63	B & M	Cab seat pedestal failed.
44	6-28-63	New Haven	Cab seat failed at seat post.
45	2-1-63	Wabash	Cab seat back rest positioning device failed.

<u>Case No.</u>	<u>Date</u>	<u>Railroad</u>	<u>Remarks</u>
46	1-19-63	NYC	Cab seat gave way at weld causing failure and injury.
47	8-30-62	NYC	Cab seat collapsed due to defective supporting assembly.
48	8-7-62	NYC	Cab seat back rest failed due to defective swivel pins.
49	7-30-62	NYC	Failure of cab seat back rest due to defective swivel pins.
50	6-22-62	NYC	Employee fell to floor due to improperly secured cab seat.
51	5-18-62	C. & N.W.	Employee fell to floor due to cab seat not secured to pedestal.
52	5-13-62	Union Pac.	Employee fell backward due to cab seat back rest failure.
53	4-7-62	Pitts&Lake E.	Cab seat failed due to defective weld.
54	3-2-62	SOU	Cab seat and cushion came separated from pedestal.
55	2-25-62	C. & N.W.	Cab seat and cushion and back rest came separated from pedestal.
56	2-17-62	NYC	Cab seat back rest broke away from seat and fell to floor.
57	1-15-62	New Haven	Cab seat failed due to missing and defective swivel plate clamps.
58	12-18-61	B & M	Cab seat failed due to broken bolt at mounting bracket attaching seat frame to wall.
59	12-4-61	B & M	Cab seat back rest dropped down due to loose and missing screws.
60	12-1-61	IL Cent.	Cab seat failed due to defective weld.
61	10-21-61	K.C.S.	Cab seat detached from pedestal bracket and fell to floor.
62	9-5-61	NYC	Cab seat failed due to defective adjusting mechanism.

<u>Case No.</u>	<u>Date</u>	<u>Railroad</u>	<u>Remarks</u>
63	8-14-61	PA	Cab seat back rest came detached due to defective hinge brackets.
64	7-23-61	PA	Cab seat failed due to defective hinge.
65	5-17-61	B & M	Cab seat failed due to defective weld.
66	3-24-61	MO Pac.	Cab seat back rest fell due to positioning device failing.
67	3-22-61	St.L.-S.F.	Cab seat back rest failed due to improper repairs.
68	12-21-60	Sou. Pac.	Cab seat back rest failed due to adjusting mechanism failing.
69	12-18-60	MO Pac.	Cab seat came detached from floor due to improper repairs.
70	12-16-60	PA	Cab seat back rest failed due to use of improper screws.
71	12-8-60	NYC	Cab seat failed at weld securing pedestal to base.

FROM RAILROAD RECORDS

72	3-7-71	Louis&Nash	Cab seat collapsed with engineer.
73	12-21-70	" "	Cab seat back rest broke off.
74	3-10-70	" "	Cab seat back rest cushion came loose.
75	7-31-67	" "	Cab seat back rest fell of from seat.
76	8-6-71	Burl.Nor.	Top of seat box collapsed to bottom.
77	8-20-70	" "	Cab seat adjusting pin removed and seat fell.
78	1-9-70	" "	Cab seat fell down.
79	5-14-72	SOU	Employee injured adjusting cab seat.
80	12-6-71	"	Employee injured reversing seat position.
81	10-24-71	"	Employee injured adjusting cab seat.
82	8-31-71	"	Employee injured relocating cab seat.

<u>Case No.</u>	<u>Date</u>	<u>Railroad</u>	<u>Remarks</u>
83	6-11-71	SOU	Employee injured on cab seat.
84	4-2-71	SOU	Cab seat back rest failed, folding backward
85	10-23-70	"	Employee injured sitting down on back rest folded down on seat.
86	9-15-70	"	Cab seat back rest fell back due to defective pin.
87	5-2-70	"	Employee injured on cab seat.
88	6-20-71	Sou. Pac.	Cab seat broke where previously welded to pedestal due to poor weld penetration.
89	7-23-70	" "	Cab seat pulled loose from seat frame.
90	12-3-68	" "	Cab seat broke loose at weld.
91	11-30-68	" "	Cab seat slid past stop and fell out of bracket onto floor.
92	6-10-66	" "	Cab seat fell back due to anchor bolts coming out.
93	8-7-63	" "	Employee injured on cab seat.
94	3-31-62	" "	Employee injured adjusting cab seat.
95	2-19-62	" "	Cab seat adjustment device permitted seat to drop suddenly.
96	1-1-62	" "	Cab seat slipped down.
97	9-5-61	" "	Cab seat collapsed.
98	3-13-61	" "	Cab seat broke and arm rest injured employee.
99	10-5-60	" "	Cab seat came out of stand and fell backward.
100	2-26-60	" "	Cab seat dropped suddenly due to failure of adjusting device.
101	9-5-68	Chi.Burl.& Quincy	Employee injured on seat edge.

CAB ENVIRONMENT INVOLVING INJURYINJURIES FROM CAB WINDOWS

<u>Case No.</u>	<u>Date</u>	<u>Railroad</u>	<u>Remarks</u>
WINDOW AND MECHANISM DEFECTS			
1	3-13-72	SOU	Employee injured trying to open cab window when stuck window suddenly released.
2	3-1-72	MO Pac.	Sliding cab window wear plates in slide worn, window hard to open.
3	12-8-71	SOU	Brakeman injured trying to open stuck cab window.
4	9-17-71	SOU	Conductor injured when window fell out of runway in cab.
5	6-13-71	Penn-Cent.	Sliding cab window fell out of runway.
6	2-1-71	SOU	Brakeman injured finger trying to open stuck cab window.
7	9-21-70	SOU	Conductor injured hand opening cab window.
8	7-22-70	Burl.Nor.	Engineer injured elbow on window frame edge.
9	10-30-69	Louis&Nash	Engineer injured finger when caught while opening cab window.
10	9-8-65	PA	Cab sliding window and frame fell out due to broken and missing screws.
11	8-11-65	Spot.Port & Sea.	Cab sliding window and frame fell out due to deteriorated condition.
12	12-17-64	PA	Cab sliding window fell out due to failure of bolts securing channel.
13	11-10-64	PA	Cab sliding window fell out due to failure of bolts securing top runner.
14	8-26-63	C.& N.W.	Failure of cab window sill arm rest brackets caused employee to fall out of cab.
15	8-9-63	B & M	Cab sliding window fell out due to defective window guides.
16	9-17-62	PA	Front cab window fell from wall due to deteriorated molding.

<u>Case No.</u>	<u>Date</u>	<u>Railroad</u>	<u>Remarks</u>
17	9-13-62	NYC	Employee injured trying to close window due to bent and rusty channels.
18	2-3-62	MO Pac.	Rear cab door window pane fell out of door due to improperly fit & applied.
19	1-19-61	St.L.&S.F.	Employee injured on defective cab window operating mechanism.

19 Cases -- 19 Injuries

BROKEN WINDOWS

1	5-17-72	Sou.Pac.	Rock thrown up and through window due to tie wedged in track.
2	2-29-72	" "	Rock thrown through cab window - vandalism.
3	2-22-72	" "	Rock thrown through cab window - vandalism.
4	1-21-72	" "	Rock thrown through cab windshield - vandalism.
5	10-29-71	SOU	Rock thrown into cab windshield -vandalism.
6	9-21-71	SOU	Rock thrown through window into cab - vandalism.
7	9-12-71	SOU	Rock thrown through window into cab - vandalism.
8	9-8-71	SOU	Rock thrown through window into cab - vandalism.
9	7-7-71	Burl.Nor.	Rock thrown through window into cab - vandalism.
10	5-14-71	SOU	Rock thrown through window into cab - vandalism.
11	10-8-70	SOU	Rock thrown through window into cab - vandalism.
12	10-2-70	SOU	Rock thrown through window into cab - vandalism.

<u>Case No.</u>	<u>Date</u>	<u>Railroad</u>	<u>Remarks</u>
13	9-7-70	SOU	Rock thrown through window into cab - vandalism.
14	12-22-68	C.B.&Q.	Train hit snow drift at 50 mph - front window in cab broken.

14 Cases -- 14 Injuries

CAB ENVIRONMENT INVOLVING INJURYINJURIES FROMSTRIKING APPURTENANCES IN CAB

<u>Case No.</u>	<u>Date</u>	<u>Railroad</u>	<u>Remarks</u>
1	6-7-72	SOU	Engineer adjusting sun visor- hand struck window, cut thumb
2	1-30-72	E.L.	Fireman hurt back going through small toilet compartment door.
3	10-10-71	SOU	Engineer bruised ledt ankle when struck it on dead man pedal.
4	10-4-71	SOU	Trainman carrying radio struck knee on cab step.
5	6-5-71	Burl.Nor.	Switchman struck knee against fire extinguisher.
6	10-20-70	SOU	Engineer injured removing automatic brake handle.
7	8-29-70	SOU	Fireman sprained wrist turning rotair valve.
8	8-29-70	SOU	Trainman injured bumping against train control apparatus.
9	8-15-70	Burl.Nor.	Brakeman struck head on top of door frame.
10	7-17-70	SOU	Employee struck head on train control generator bracket.
11	6-5-70	SOU	Fireman resetting levers, injured hand.
12	6-3-70	SOU	Engineer resetting controls, seal broke, struck hand on control panel.
13	5-29-70	SOU	Trainman jabbed in eye by antenna of portable radio.
14	5-12-70	SOU	Engineer struck hand against train control housing.
15	5-13-70	SOU	Fireman struck hand against control stand.
16	4-24-70	SOU	Engineer struck knee aginst reverse lever.
17	4-11-70	SOU	Engineer struck knee against radio.
18	4-9-70	SOU	Engineer struck hand against control stand.

CAB ENVIRONMENT INVOLVING INJURYINJURIES FROM FALLING OBJECTS

<u>Case No.</u>	<u>Date</u>	<u>Railroad</u>	<u>Remarks</u>
1	10-1-71	SOU	Engineer struck by falling fire extinguisher.
2	6-14-71	SOU	Engineer struck by falling control panel bac.
3	6-12-71	SOU	Engineer struck by falling fire extinguisher.
4q	3-21-71	SOU	Brakeman struck on hand by falling radio.
5	8-30-70	SOU	Engineer struck on hand by falling radio.
6	5-23-70	K.C.S.	Fireman injured when cab awning fell on head.
7	3-25-70	L. & N.	Engineer struck on foot by falling radio.
8	1-5-70	SOU	Brakeman struck on foot by falling fire extinguisher.
9	3-19-66	PA	Employee struck by falling ceiling panel.
10	10-14-65	M.P.	Employee struck by falling fire extinguisher due to defective securing latch.
11	7-10-65	NYC	Employee struck by falling fire extinguisher that was not secured.
12	7-14-64	C. & E.L.	Employee struck by falling radio not locked in securely.
13	6-12-64	WAB	Employee struck by falling number plate inadequately latched.
14	5-23-64	B. & O.	Employee struck by falling fire extinguisher.
15	6-18-63	U.P.	Employee struck by falling fire extinguisher due to defective bracket.
16	4-19-63	Ft.W. & D.	Employee struck by falling air horn.
17	4-15-63	N.P.	Employee struck by falling fuse and light bulb container.
18	10-20-62	NYC	Employee struck by falling fire extinguisher installed improperly.

CAB ENVIRONMENT INVOLVING INJURYINJURIES FROM WATER COOLERS

<u>Case No.</u>	<u>Date</u>	<u>Railroad</u>	<u>Remarks</u>
1.	1-21-72	T & P	Unsecured drinking water bottle fell from cooler, broke and cut brakeman.
2.	12-22-71	B.N.	Switchman injured when water bottle on enginer broke.
3.	11-22-71	B.N .	Fireman injured placing water bottle on cooler when it slipped and broke.
4.	10-25-71	SOU	Engineer carrying water cooler from cab slipped and fell, injuring foot.
5.	10-22-71	SOU	Engineer carrying water cooler into cab slipped and fell.
6.	8-22-71	SOU	Hostler injured carrying water cooler onto the unit slipped and fell.
7.	8-3-71	B.N.	Switchman injured when water bottle broke.
8.	6-16-71	SOU	Fireman placing water cooler in place in cab strained back.
9.	11-30-70	SOU	Employee struck chin on water cooler bracket.
10.	11-12-70	SOU	Engineer while turning rotair valve cut hand on water cooler bracket.
11.	10-10-70	SOU	Engineer injured trying to place water cooler on engine.
12.	8-20-70	SOU	Engineer injured picking up water cooler on engine.
13.	8-7-70	SOU	Trainman carrying water cooler on engine slipped and fell.
14.	6-27-70	AT & SF	Engineer cut tendon in arm when glass water bottle broke.
15.	4-25-64	M.P.	Water cooler overturned - wood screws securing cooler to cab floor were loose and missing.

15 Cases -- 15 Injuries

CAB ENVIRONMENT INVOLVING INJURYINJURIES FROM TRIPS ON OBSTRUCTION IN CAB OR NOSE

<u>Case No.</u>	<u>Date</u>	<u>Railroad</u>	<u>Remarks</u>
1.	4-11-72	S.P.	Conductor tripped on threshold of rear cab door.
2.	5-14-71	B.N.	Engineer tripped on lid of toilet on floor.
3.	9-14-70	B.N.	Hostler tripped on hand brake stand in cab.
4.	8-14-70	B.N.	Engineer tripped on engineers foot rest.
5.	2-23-70	B.N.	Fireman tripped on dead man control pedal.
6.	5-31-62	N.Y.C.	Employee tripped on defective cab threshold.
7.	1-8-61	PENNA.	Employee tripped on insecure plate over hole.

7 Cases -- 7 Injuries

CAB ENVIRONMENT INVOLVING INJURYINJURIES FROM TRAP DOORS AND OPENINGS IN CAB FLOOR

<u>Case No.</u>	<u>Date</u>	<u>Railroad</u>	<u>Remarks</u>
1.	12-21-71	B.N.	Brakeman used paking hook to open trap door - hook slipped and door fell on foot.
2.	9-17-71	P.C.	Employee opening trap door - door slipped and struck foot.
3.	6-9-70	SOU	Employee caught finger between trap door and water cooler bracket.
4.	5-8-70	B.N.	Employee stepped into opening when trap door had been left open.
5.	1-2-70	B.N.	Employee fell into opening when trap door had been removed.
6.	6-18-65	C.R.I. & P.	Employee fell into opening when trap door had failed.
7.	2-15-65	S.P.	Employee struck by unfastened trap door that fell.
8.	8-15-62	C.&N.W.	Employee struck by unfastened trap door that fell.

8 Cases -- 8 Injuries

CAB ENVIRONMENT INVOLVING INJURYINJURIES FROM CAB HEATERS

<u>Case No.</u>	<u>Date</u>	<u>Railroad</u>	<u>Remarks</u>
1.	5-31-72	SOU.	Engineer injured hand on cab heater valve.
2.	4-17-72	MILW.	Brakeman injured hand sticking fingers into heater fan.
3.	10-27-70	SOU.	Brakeman injured hand sticking it through guard to check fan.
4.	9-21-70	SOU.	Engineer injured had sticking it into heater to check it.
5.	1-12-70	C.R.I. & P.	Fireman burned from ruptured cab heater.
6.	1-10-70	P.C.	Engineer injured hand in heater fan with guard missing.
7.	1-7-70	SOU.	Yardman injured hand in heater fan sticking finger in to check it.
8.	1-26-68	S.P.	Fireman injured hand in heater fan sticking finger in to check it.
9.	11-7-60	S.A.L.	Employee injured hand when finger was caught in heater fan that was not properly guarded.

9 Cases -- 9 Injuries

CAB ENVIRONMENT INVOLVING INJURYSLIPS AND FALLS ON CAB FLOORS AND STEPS AND NOSE COMPARTMENTS

<u>Case No.</u>	<u>Date</u>	<u>Railroad</u>	<u>Remarks</u>
1.	5-10-72	S.P.	Engineer climbing up from nose compartment into cab with shoes wet from wet floor, slipped on step into cab.
2.	1-15-72	L. & N.	Engineer exiting from cab missed step.
3.	8-27-71	SOU.	Brakeman walking out cab door slipped account oil on shoes and floor.
4.	8-22-71	SOU.	Engineer slipped on step from cab to engine room.
5.	7-11-71	B.N.	Employee slipped on oil on floor in nose compartment.
6.	6-2-71	SOU.	Employee slipped on step from cab to engine room.
7.	5-20-71	SOU.	Engineer unlocking cab door lost footing and fell from top cab step.
8.	5-19-71	SOU.	Engineer slipped on fusee on cab floor.
9.	5-15-71	SOU.	Engineer slipped on oil on cab floor.
10.	4-25-71	SOU.	Fireman slipped stepping to cab door.
11.	3-10-71	SOU.	Conductor entering engine cab slipped and fell when opening door.
12.	12-21-70	E.L.	Engineer descending from cab to nose compartment fell account access loader out of place and lying on floor.
13. 13.	10-26-70	SOU.	Engineer slipped on fusee on cab floor and fell.
14.	10-5-70	SOU.	Fireman slipped on chain lying loose on nose compartment floor.
15.	8-21-70	SOU.	Employee slipped on step from cab to engine room.
16.	3-28-70	A.T. & S.F.	Brakeman slipped on defective cab step.
17.	8-7-69	B.N.	Engineer slipped on cab floor and fell.

<u>Case No.</u>	<u>Date</u>	<u>Railroad</u>	<u>Remarks</u>
18.	12-28-68	B.N.	Fireman slipped on step from cab to engine room.
19.	11-22-68	B.N.	Engineer fell descending from cab to nose compartment.
20.	9-26-66	L. & N.	Engineer slipped on ice on cab floor.
21.	6-10-65	N.Y.C.	Brakeman slipped and fell leaving cab account oil on shoes.
22.	11-14-64	A.T. & S.F.	Employee slipped on oil on cab floor that had been tracked in.
23.	10-27-64	E.L.	Employee slipped on oil on step leaving cab account grease on step.
24.	10-16-64	N.H.	Employee slipped when leaving cab falling to ground account oil on shoes from oily walkways.
25.	9-17-64	PENNA.	Employee slipped on oil on cab floor from ruptured tube of oil guage.
26.	4-8-64	N.Y.C.	Employee slipped on oil on wooden cab floor.
27.	10-18-63	WAB.	Employee slipped on water on cab floor from leaking water cooler.
28.	6-19-63	L. & N.	Employee slipped when opening cab to engine room door.
29.	6-3-63	B. & O.	Employee slipped on wet cab floor due to improper maintenance of door and window stripping.
30.	11-18-61	U.P.	Employee slipped on ice on cab floor.
31.	8-15-61	M.K.T.	Employee slipped on oil on cab floor.
32.	11-28-60	M.K.T.	Employee slipped on water on cab to engine room step.

32 Cases -- 32 Injuries

CAB ENVIRONMENT INVOLVING INJURYINJURIES WITHIN CAB RESULTING FROM BRAKE & BRAKE EQUIPMENT DEFECTS

	<u>Date</u>	<u>Railroad</u>	<u>Remarks</u>
1.	6-21-66	E.L.	Undesired emergency due to parting of air hose, loco to car - worn hose head.
2.	5-9-66	E.L.	Undesired emergency due to parting of air hose, loco to car - worn hose head.
3.	3-23-66	N.Y.C.	Undesired emergency due to hard working automatic brake valve.
4.	1-30-66	E.L.	Hard working automatic brake valve caused severe back strain to engineer.
5.	1-18-66	B.R. of Chi.	Defective locomotive air brake caused hard coupling.
6.	12-7-65	N.Y.C.	Inoperative brakes due to blown fuse in master controller caused colliion.
7.	12-3-65	PENNA.	Undesired emergency due to grounds in control brake circuit.
8.	10-25-65	READ.	Undesired emergency due to defective sanding switch causing wheel slips.
9.	5-28-65	N.Y.C.	Train surged forward due to failure of exciter generator.
10.	3-6-65	N. & W.	Inability to apply brakes from control unit due to angle cock being closed between units resulted in collision.
11.	2-1-65	PENNA.	Undesired brake application actuated by defective train control system.
12.	1-14-65	N.Y.C.	Undesired emergency due to excessive leak from main reservoir automatic drain valve.
13.	10-27-64	PENNA.	Undesired emergency due to parting of air hose, loco to car - worn hose head.
14.	9-4-63	N.Y.C.	Hard slack action due to defective relay-air valve.
15.	6-6-63	G.N.	Hard coupling due to ruptured relayair valve diaphragm.
16.	4-1-63	PENNA.	Undesired emergency due to parting of air hose, loco to car - worn hose head.

<u>Case No.</u>	<u>Date</u>	<u>Railroad</u>	<u>Remarks</u>
17.	3-21-63	N.Y.C.	Ineffective locomotive brakes resulted in collision with bumping post.
18.	2-20-63	PENNA.	Undesired emergency due to defective vent valve.
19.	9-17-62	N.Y.C.	Undesired emergency due to defective rotary valve of automatic brake valve.
20.	6-6-62	N.Y.C.	Ineffective brakes on locomotive (brakes cut out) resulted in collision.
21.	3-1-62	N.Y.C.	Ineffective brakes on locomotive (brakes cut out) resulted in collision.
22.	2-14-62	PENNA	Undesired emergency due to low voltage from defective auto. train stop generator.
23.	1-26-61	B.& O.	Inoperative locomotive air brakes due to improperly positioned rotair valve.
24.	12-8-60	S.P.	Hard working automatic brake valve due to inadequate lubrication.
25.	7-31-60	B.& O.	Undesired emergency due to defective gasket in brake valve.
26.	7-15-60	N.Y.C.	Undesired emergency due to low voltage from defective auto. train stop generator.

26 Cases -- 30 Injuries

CAB ENVIRONMENT INVOLVING INJURYFUMES, SMOKE AND GAS IN CAB

<u>Case No.</u>	<u>Date</u>	<u>Railroad</u>	<u>Remarks</u>
1. 4-	4-13-72	S.P.	Brakeman - inhalation of fumes from engine in cab.
2.	4-6-72	Leh.Val.	Smoke inhalation in cab from fire in exciter circuit.
3.	2-13-72	S.P.	Brakeman - inhalation of smoke and fumes from engine in cab.
4.	6-9-71	SOU.	Trainman - inhalation of smoke and fumes from engine in cab.
5.	9-13-70	P. Cent.	Engineer - inhalation of fumes from battery in cab.
6.	2-3-70	B.N.	Engineer - inhalation of smoke when motor caught fire.
7.	5-2-66	PENNA.	Inhalation of smoke and fumes from engine in cab - defective exhaust headers.
8.	4-16-66	N.Y.C.	Inhalation of fuel fumes in cab from excessive fuel leakage.
9.	12-8-65	PENNA.	Inhalation of smoke and fumes in cab - defective exhaust manifold.
10.	6-21-65	N.Y.C.	Inhalation of fuel fumes in cab - fuel leakage from fuel tank.
11.	6-16-65	N.Y.C.	In halation of fumes in cab - defective fuel manifold.
12.	5-22-65	L.& N.	Inhalation of gas and fumes in cab from batteries - overcharged and overheated.
13.	12-21-64	PENNA.	Inhalation of gas and fumes in cab from malfunctioning steam generator.
14.	12-3-64	N.H.	Inhalation of smoke and fumes in cab from defective turbocharger.
16.	9-22-64	PENNA.	Inhalation of fumes in cab - acid fumes from overcharged batteries.
17.	7-15-64	ST.L.& S.F.	Inhalation of exhaust fumes in cab from engine - defective exhaust manifolds.

<u>Case No.</u>	<u>Date</u>	<u>Railroad</u>	<u>Remarks</u>
18.	5-1-64	N.Y.C.	Inhalation of smoke and fumes in cab from extinguishing fire in elec. cont. cabinet.
19.	4-13-64	WAB.	Inhalation of smoke and fumes in cab - defective power assemblies.
20.	1-8-64	B.& M.	Inhalation of smoke and fumes in cab - defective steam generator.
21.	11-4-63	MILW.	Inhalation of smoke and fumes in cab - engine exhaust system leaks.
22.	9-12-63	MILW.	Inhalation of smoke and fumes in cab - defective air box cover blew off engine.
23.	1-4-63	N.H.	Inhalation of smoke and fumes in cab - steam heat generator.
24.	12-10-62	N.H.	Inhalation of fumes in cab - defective voltage regulator caused batteries to gas.
25.	12-8-61	M.K.T.	Inhalation of exhaust fumes in cab from engine.
26.	11-19-61	N.Y.C.	Inhalation of exhaust fumes in cab from engine.
27.	7-17-61	N.H.	Inhalation of exhaust fumes in cab from engine - defective exhaust manifolds.
28.	6-15-61	N.Y.C.	Inhalation of exhaust fumes in cab from engine - defective exhaust manifolds.
29.	3-7-61	PENNA.	Inhalation of exhaust fumes in cab from engine p defective exhaust manifolds.
30.	8-11-60	PENNA.	Inhalation of exhaust fumes in cab from engine - defective exhaust manifolds.

30 Cases -- 35 Injuries

CAB ENVIRONMENT INVOLVING INJURYEYE INJURIES

<u>Case No.</u>	<u>Date</u>	<u>Railroad</u>	<u>Remarks</u>
1.	7-31-72	L.&N.	Fireman - sand in eye from sanders.
2.	6-30-72	S.P.	Engineer - sand in eye while looking out window.
3.	5-31-72	S.P.	Engineer - metal in eye while looking out window.
4.	5-4-72	S.P.	Engineer - sand in eye while looking out window.
5.	4-26-72	B.N.	Engineer - sand in eye while cleaning cab with air hose.
6.	4-18-72	S.P.	Engineer - sand in eye while looking out window.
7.	4-8-72	S.P.	(same as above)
8.	3-22-72	S.P.	(same as above)
9.	3-3-72	S.P.	(same as above)
10.	3-3-72	S.P.	Brakeman - (same as above)
11.	2-23-72	S.P.	Engineer - (same as above)
12.	2-21-72	S.P.	Fireman - (same as above)
13.	1-27-72	S.P.	(same as above)
14.	11-10-71	SOU.	Engineer - sand flew in eye while operating engine.
15.	9-5-71	B.N.	Engineer - sand flew in eye while looking out window.
16.	8-29-71	SOU.	Conductor - sand flew in eye while in cab of engine.
17.	8-17-71	B.N.	Engineer - sand flew in eye while looking, switching.
18.	8-15-71	SOU.	Engineer - sand flew in eye.
19.	8-15-71	SOU.	Conductor - piece of steel in eye while in cab of engine.

<u>Case No.</u>	<u>Date</u>	<u>Railroad</u>	<u>Remarks</u>
20.	8-10-71	SOU.	Brakeman - foreign matter in eye while in cab of engine.
21.	7-18-71	B.N.	Engineer - foreign matter in eye while operating brakes.
22.	6-27-71	SOU.	Brakeman - rust in eye while in cab of engine.
23.	11-26-70	SOU.	Engineer - foreign matter in eye while operating engine.
24.	11-25-70	SOU.	(same as above)
25.	11-13-70	SOU.	(same as above)
26.	11-6-70	SOU.	(same as above)
27.	10-19-70	SOU.	Trainman - foreign matter in eye while riding on engine.
28.	10-1-70	SOU.	Fireman - eye hit by foreign object.
29.	10-1-70	B.N.	Engineer - foreign matter in eye while looking train over.
30.	9-27-70	SOU.	(same as above)
31.	9-23-70	B.N.	Engineer - foreign matter in eye while looking when spreading ballast.
32.	9-16-70	SOU.	Engineer - foreign matter in eye while performing regular duties.
33.	9-14-70	SOU.	(same as above)
34.	9-9-70	SOU.	Switchman - foreign matter in eye while on light engine.
35.	9-6-70	SOU.	Engineer - foreign matter in eye while performing regular duties.
36.	8-15-70	SOU.	Engineer - sand blew in eye while operating engine.
37.	8-13-70	SOU.	Engineer - foreign particle blew in eye.
38.	8-12-70	B.N.	Brakeman - foreign particle blew in eye when brake application made.
39.	8-10-70	SOU.	Engineer - foreign particle blew in eye while operating engine.

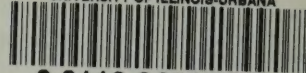
<u>Case No.</u>	<u>Date</u>	<u>Railroad</u>	<u>Remarks</u>
40.	8-10-70	SOU.	Engineer - foreign matter in eye when wheel slip light blew out of socket.
41.	8-5-70	SOU.	Fireman - rust blew into eyes.
42.	8-4-70	SOU.	Conductor - sand blew into eyes.
43.	8-2-70	SOU.	Engineer - foreign particle blew into eye.
44.	7-27-70	SOU.	Engineer - foreign particle blew into eye while operating engine.
45.	7-26-70	SOU.	(same as above)
46.	7-25-70	SOU.	(same as above)
47.	7-24-70	SOU.	Switchman - sand blew into both eyes.
48.	7-22-70	SOU.	Engineer - sand blew into eye when leaned of window to get signal.
49.	7-5-70	SOU.	Engineer - foreign particle blew into eye.
50.	7-4-70	SOU.	Engineer - sand blew in eyes while performing regular duties.
51.	7-4-70	SOU.	Brakeman - sand from engine blew in eyes.
52.	6-27-70	SOU.	Flagman - foreign object blew in eye while looking out window over train.
53.	6-24-70	SOU.	Engineer - foreign object blew in eye.
54.	6-22-70	SOU.	(same as above)
55.	6-7-70	SOU.	(same as above)
56.	5-30-70	SOU.	Engineer - foreign object blew in eye while switching in yard.
57.	5-28-70	SOU.	Switchman - foreign object blew in eye while riding engine.
58.	5-25-70	SOU.	Engineer - sand blew into eye.
59.	5-13-70	SOU.	(same as above)
60.	5-10-70	B.N.	Engineer - foreign body blew in eye while looking out window.

<u>Case No.</u>	<u>Date</u>	<u>Railroad</u>	<u>Remarks</u>
61.	5-1-70	SOU.	Engineer - foreign body blew in eye.
62.	4-21-70	B.N.	Engineer - foreign body blew in eye while looking out window.
63.	4-7-70	SOU.	Engineer - foreign body blew in eye while looking for signals.
64.	3-24-70	SOU.	Engineer - foreign body blew in eye while dumping rock.
65.	3-16-70	SOU.	Engineer - foreign body blew in eye while moving engine.
66.	1-23-69	L. & N.	Fireman - foreign body blew in eye while looking out window.

66 Cases -- 66 Injuries

HE injuries in cabs of
1780 Central Technology,
.133 Identification and
1972 categorization of
C.2 accidents and
injuries in

UNIVERSITY OF ILLINOIS-URBANA



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